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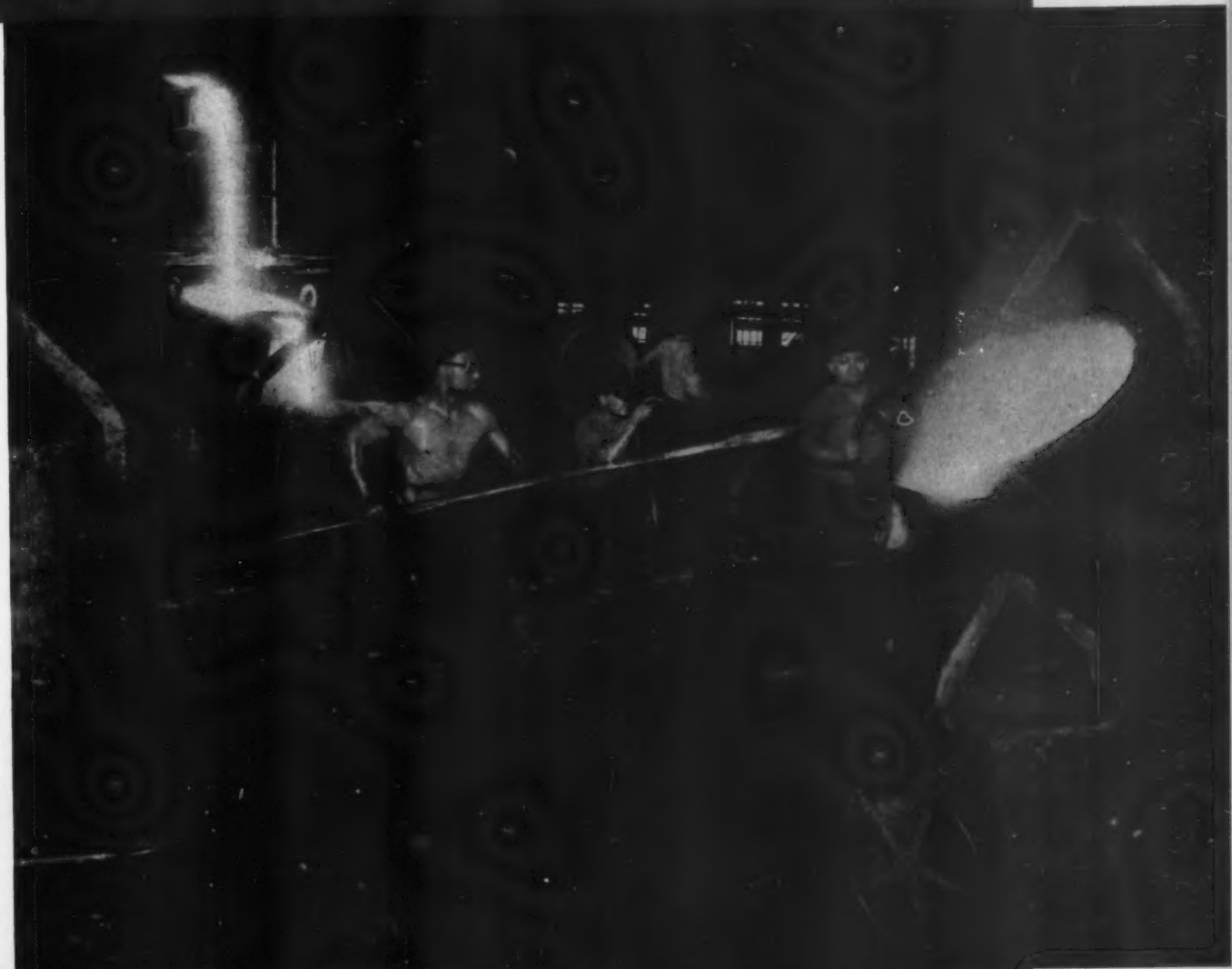
American Foundryman

A PUBLICATION PRESENTING ASSOCIATION AND CHAPTER ACTIVITIES

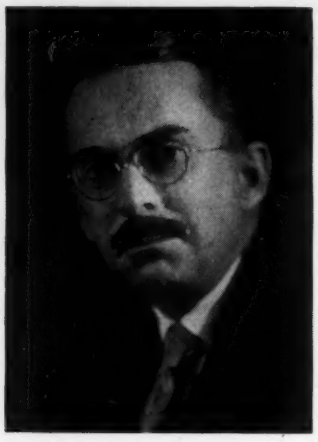


"ACTION" SCENE IN FOUNDRY OF CINCINNATI MILLING MACHINE CO.

Cincinnati Chapter Organizes for Annual Convention, See Page 2 — Convention Program, See Page 4 — New England Regional Conference, See Page 6 — East Lansing Regional Conference, See Page 7 — April Chapter Meetings, See Page 20.

April
1939

Steel Division Activities



The steel division of the A.F.A., under the able direction of previous chairmen, was organized into actively functioning committees, with the object of keeping the members abreast of current progress in the steel foundry art. These committees have aimed first at developing the necessary data, when no other adequate means existed to ascertain the desired facts; and second, at keeping in close touch with all sources from which early, authoritative information could be obtained. The committees thus keep members informed of current developments by periodic reports setting forth the essential data.

In accordance with the above outlined policy, valuable reports have been presented by the committees on methods of making steel for castings, on heat treatment, on coupons, and on radiography. In addition, the committee on coupons is collecting data on its own account from various sources which it is expected will form the basis of a further valuable report on this important subject.

The committee on radiography is taking an active part in the work of the A.S.T.M. committee on radiography, with a view to assisting in the development of standards for this method of examination that will be satisfactory to all concerned. The newly formed impact committee, also, in addition to furnishing our members with up-to-the-minute information in their field, aims to be in a position to furnish specification-writing bodies with the facts essential to the proper drafting of specification, if, as, and when it appears desirable that such specifications should be adopted. These two committees, therefore, act also in an advisory capacity to those in other organizations who are concerned with matters affecting steel castings.

The committee on papers and program, will continue this year the presentation of contributions covering the most important and interesting developments in the steel castings field. Following up the important papers presented in 1938 on steel making methods, emphasis this year will be laid upon a symposium covering all methods of steel making now commonly used for steel castings, and upon a round table discussion of deoxidation methods which will bring up to date the invaluable information contributed last year by several authors.

John Howe Hall

JOHN HOWE HALL, Chairman
A.F.A. Steel Castings Division.

Mr. Hall is consultant on steel castings, an honorary member of A.F.A. and in 1925 was awarded the J. H. Whiting gold medal of the A.F.A. in recognition of his outstanding contributions to the steel casting industry. He has been an extensive contributor to the published literature on steel castings and an intensive worker in technical committees dealing with steel castings.

A. F. A.
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***Headquarters**
Room 1248, 222 West Adams St., Chicago, Ill.

American Foundryman

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Entered as second class matter July 22, 1938, at the post office at Chicago, Illinois, under the Act of March 3, 1879.

Cincinnati Chapter Organizes Committees for Annual Convention in May

WITH the completion of the organization of the Cincinnati District Chapter, plans for the foundry industry of the district to act as host to the many foundrymen who will attend the 43rd Annual A.F.A. Convention are nearing completion. The officers and directors recently elected to direct the chapter are reported elsewhere in this issue of AMERICAN FOUNDRYMAN. George Seyler, Lunkenheimer Company, and a director of A.F.A., presided at a recent meeting of chapter officials and others, at which time members of the various committees to direct the local convention arrangements were appointed. The complete committee personnel is shown on the opposite page.

Plant Visitation

Of these committees one of the most important is that on plant visitation under the chairmanship of Philip H. Cone, Cincinnati Milling Machine Co. This committee, while planning to facilitate visits to the many interesting industrial plants of the district during the entire week, is featuring for Monday afternoon, May 15, a special general group inspection of the Cincinnati Milling Machine Company works. The entire afternoon of that day will be devoted solely to this activity. On the remaining days the committee will have available at convention headquarters in the Hotel Gibson, complete information on hours of visitation, transportation methods, etc., of the other plants open for inspection.

Lecture Course on Elementary Metallurgy and the Use of the Microscope

An added feature of this year's program will be the lecture course conducted by R. M. Allen, noted microscopist and consultant of Bloomfield, N. J. Mr. Allen has revised and enlarged the material of a paper which he presented before the 1931 A.F.A. convention. This paper which received such universal approval because of its instructional value, in its revised form will be issued as a book which will be first made available to those attending the lecture course at Cincinnati.

Technical Program

On pages 4 and 5 will be found the tentative program of technical and shop practice sessions. It will be noticed that the malleable and non-ferrous divisions have their sessions on the first two of the convention days, the steel division on the last two days, while sessions of the gray iron division are held throughout the entire four days. Of general interest to all foundrymen will be the sessions on materials handling, sand control, refractories, castability, safety and hygiene, time study, pattern making, apprentice and foreman training.

Annual Dinner and Board of Awards Lecture

Two other features of the convention will be the second annual Board of Awards lecture and the annual A.F.A. dinner. The Awards lecture is being chosen from among the nation's most prominent speakers and the address will be of the same high standard as the one given last year by Chas. Hook, President of the National Association of Manufacturers, who was chosen to give the first Awards lecture.

The many other papers, reports and discussions of the program guarantee that those attending this

Cincinnati chapter convention committee meets. Left to right (standing)—R. Frankl, treasurer; E. B. Hausfeld, secretary; George Seyler, chairman; Ray Redmond, vice chairman and chairman ladies' entertainment committee; C. A. Peebles, chapter director. (Seated)—C. E. Hoyt, executive vice president, A.F.A.; Wm. Ball, Jr., chapter director, Herman K. Ewig, chapter chairman, and H. F. McFarlin, chapter vice-chairman.

year's convention will be assured of one of the most interesting meetings in the history of the Association and with the hospitable welcome being prepared by the local foundrymen, the week will long and pleasantly be remembered by those participating.

Non-Ferrous Division to Hold Get-Together Dinner Stout to Present Romance of Aviation

A new feature of the annual convention for the Non-Ferrous Division members will be the social dinner gathering on Tuesday evening, May 16, at the Hotel Gibson. The dinner is being arranged to promote acquaintanceship and to provide an enjoyable evening affair for the non-ferrous foundrymen and their ladies attending the convention.

A musical program is being arranged and as a special treat, William B. Stout, president of the Stout Engineering Laboratories, Dearborn, Michigan, will give an address on "The Romance of Aviation." Mr. Stout is consultant to the U. S. Government and aeroplane advisor for practically all aeroplane manufacturers.

Harold J. Roast, Canadian Bronze Co. and chairman of the Non-Ferrous Division, requests the cooperation of those planning to attend by sending in their reservations by mail to the A.F.A. office. The dinner will be $2.50 per person and dress will be strictly informal.

Cincinnati Convention Committee

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George Seyler, *Chairman*
Ray Redmond, *Vice Chairman*
Edw. B. Hausfeld, *Secretary*
Robert Frankl, *Treasurer*
Bruce Hill, *Chairman Finance Committee*
Herman K. Ewig, *Chairman Reception Committee*
Harold Ritter, *Chairman Hotel Committee*
Edw. T. Korten, *Chairman Publicity Committee*
Art Oberhelman, *Chairman Golf Committee*
P. H. Cone, *Chairman Plant Visitation Committee*

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John Hill, *Vice Chairman*

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Karl A. Stein	A. H. Kramer
Oliver Bardes	Charles Wise
Jos. Westendorf	Earl Thompson
Ben Kaufman	Chas. C. Erhart
Wm. A. Haven	J. W. Freiberg

S. C. Young

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J. S. Turner, *Secretary*

W. Heilig	Wm. Hoppenjans

W. C. Scott

Plant Visitation Committee

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L. Gosiger, *Vice Chairman*

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P. E. Rentschler	J. A. Bouffard
H. J. McFarlin	W. M. Gilbert
George Avril	Malcolm Fleming
Robert Ebersole	Delvin Orr

Golf Committee

Art Oberhelman, *Chairman*
Wm. Gilbert, *Vice Chairman*
Wm. Beiser

Publicity Committee

E. T. Korten, *Chairman*
J. S. Turner, *Secretary*

Frank Hutchinson	Don Gardner

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E. T. Korten, *Secretary*
R. Frankl, *Treasurer*
H. F. McFarlin, *Vice Chairman*

Wm. M. Ball, Jr.	C. A. Peebles
E. F. Loges	Ray Redmond

Earl Thompson

Transportation Committee

Ray Redmond, *Chairman*

L. C. Snyder	C. S. Blackburn

R. Cadee

Ladies' Entertainment Committee

Ray Redmond, *Chairman*

Mrs. Wm. Ball, Jr.	Mrs. John Hill
Mrs. C. S. Blackburn	Mrs. E. T. Korten
Mrs. J. W. Bolton	Mrs. E. F. Loges
Mrs. W. J. Buvinger	Mrs. H. F. McFarlin
Mrs. Philip Cone	Mrs. A. Oberhelman
Mrs. H. K. Ewig	Mrs. C. A. Peebles
Mrs. R. Frankl	Mrs. R. Redmond
Mrs. L. Gosiger	Mrs. H. Ritter
Mrs. Edw. B. Hausfeld	Mrs. George Seyler

Mrs. Earl Thompson

The firm connection of those serving on the Cincinnati Convention Committees are given below:

George Seyler, The Lunkenheimer Co., Cincinnati
Ray Redmond, Buckeye Foundry Co., Cincinnati
Edw. B. Hausfield, Ohio Pattern Works & Foundry Co.
Robert Frankl, Superior Pattern Works, Cincinnati
Bruce Hill, Hill & Griffith Co., Cincinnati.
Herman K. Ewig Cincinnati Milling Machine Co., Cincinnati
Harold Ritter, Oberhelman-Ritter Foundry Co.
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Art Oberhelman, Oberhelman-Ritter Foundry Co.
Philip Cone, Cincinnati Milling Machine Co.
George Avril, Avril Smelting Co.
Wm. Ball, Jr., Edna Brass Mfg. Co.
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Wm. Beiser, Reliance Foundry Co.
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John W. Bolton, Lunkenheimer Co.
J. A. Bouffard, Hamilton Coke & Iron Div., American Rolling Mill Co., Hamilton, Ohio
R. Cadee, Erhart Foundry & Machine Co.
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Malcolm Fleming, Hickman, Williams & Co.
Robert Frankl, Superior Pattern Co.
J. W. Freiberg, N. Ransohoff, Inc.
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Wm. Gilbert, Buckeye Foundry Co.
Lawrence Gosiger, S. Obermayer Co.
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Alex Hawes, Wheeling Steel Co.
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A. H. Kramer, Advance Foundry Co., Dayton
L. LaVoie, Griffin Wheel Co.
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H. F. McFarlin, Lunkenheimer Co.
Delvin Orr., Ranson and Orr Co.
Chester A. Peebles, Stedman's Foundry & Machine Works, Aurora, Ind.
Ray Redmond, Buckeye Foundry Co.
Peter E. Rentschler, Hamilton Foundry & Machine Co., Hamilton
W. C. Scott, Williamson Heater Co.
L. C. Snyder, Hickman-Williams & Co.
Earl H. Thompson, H. P. Deuscher Co., Hamilton
J. S. Turner, Cincinnati Convention Bureau
Jos. Westendorf, Dayton Castings Co., Dayton
Charles Wise, Buckeye Products Co.
Henry M. Wood, Cincinnati Rep., W. W. Sly Mfg. Co.
S. C. Young, D. T. Williams Valve Co.

Tentative Program

43rd Annual Convention—May 15 to 18

Headquarters and Registration—Hotel Gibson, Cincinnati, Ohio

Monday, May 15

Registration.

10:00 AM Opening Session.
Greetings.
Responses.

10:30 AM Malleable Cast Iron.

10:30 AM *Atmosphere Control in Malleablizing*, by John Dow, Holcroft & Co., Cleveland, O.

11:00 AM *White Iron for Malleablizing*, by J. O. Klein, Texas Foundries, Inc., Lufkin, Texas.

11:30 AM *Comparison of Grinding and Shearing Gates on Malleable Iron Castings*, S. D. Martin, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

10:30 AM Non-Ferrous.

10:30 AM *Production of Bronze Pressure Castings*, by D. Frank O'Connor, Walworth Co., Boston, Mass.

11:15 AM *Crucible Melting*, by G. K. Eggleston, Detroit Lubricator Co., Detroit, Mich.

10:30 AM Gray Iron Shop Course—Session 1.

Chairman: R. F. Hine, Studebaker Corp., South Bend, Ind.

Discussion Leader: Donald J. Reese, International Nickel Co., New York City.

Cupola Practice.

2:00 PM Special Works Visit to Cincinnati Milling Machine Co.

6:30 PM Malleable Round Table Meeting — Dinner Conference.

Chairman: L. N. Shannon, Stockham Pipe Fittings Co., Birmingham, Ala.

Co-Chairman: P. C. DeBruyne, Moline Malleable Iron Co., St. Charles, Ill.

Informal Discussion on Current Practices.

8:00 PM Materials Handling.

8:00 PM *Mold Equipment*, W. R. Jennings, John Deere Tractor Co., Waterloo, Iowa.

9:00 PM *Some Tests in the Effectiveness of Water Under High Pressure for Cleaning Castings*, by R. Webster, Hydroblast Corp., Chicago, Ill.

8:00 PM Non-Ferrous.

8:00 PM *Effects of Aluminum and Antimony on the Physical Properties of Red Cast Brass, (85-5-5-5)*, by H. B. Gardner and C. M. Saeger, Jr., Bureau of Standards, Washington, D. C.

8:45 PM *High Conductivity Copper Castings*, by A. B. Kinzel, Union Carbide & Carbon Research Labs., New York City.

9:30 PM *Non-Ferrous Division Annual Business Meeting.*

8:00 PM Lecture Course—Session 1.

Elementary Metallurgy and the Use of the Microscope, by R. M. Allen, Bloomfield, N. J.

Tuesday, May 16

9:00 AM Gray Iron Shop Course—Session 2.

Chairman: P. T. Bancroft, Moline, Ill.

Discussion Leader: M. A. Scott, Greenlee Foundry Co., Chicago, Ill.

Gates and Risers.

10:00 AM Malleable.

10:00 AM *Effects of Manganese on Second Stage Graphitization*, by D. P. Forbes, Gunite Foundries, Rockford, Ill.

11:00 AM *Occurrence of Hydrogen in White Cast Iron*, by H. A. Schwartz and G. M. Guiler, National Malleable & Steel Casting Co., Cleveland, O.

10:00 AM Gray Cast Iron.

10:00 AM *Some Aspects of Cracked Castings*, by L. A. Danse, Cadillac Motor Car Co., Detroit, Mich.

10:45 AM *Sixty Thousand Pound Cupola Iron*, by E. L. Roth, Motor Casting Co., Milwaukee, Wis.

11:30 AM *Castings for the British Gas Industry*, by F. Whitehouse, Newton, Chambers & Co., Ltd., Chapeltown, England. (Official Exchange Paper—Institute of British Foundrymen.)

10:00 AM Non-Ferrous.

10:00 AM *Non-Ferrous Founding*, by M. G. Corson, New York City.

11:15 AM *Influence of Pouring Ladles on Quality of Red Brass*, by R. W. Parsons, Ohio Brass Co., Mansfield, O.

10:00 AM Apprentice Training.

10:00 AM *Apprentice Training*, by Herman K. Ewig, Cincinnati Milling Machine Co., Cincinnati, O.

11:00 AM *Apprentice Training*, by M. J. Gregory, Caterpillar Tractor Co., Peoria, Ill.

12:00 N Joint Committee on Foundry Refractories—Luncheon.

12:30 PM Non-Ferrous Round Table Meeting—Luncheon.

2:00 PM Safety and Hygiene.

2:00 PM *Establishment of a Safety and Hygiene Program in a Small Foundry*, by P. E. Rentschler, Hamilton Foundry & Machine Co., Hamilton, O.

3:00 PM *The Open House and Public Relations*, by W. H. Doerfner, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

2:00 PM Castability of Metals.

2:00 PM *Castability of Cast Steel*, by C. H. Lorig, Battelle Memorial Institute, Columbus, O.

2:30 PM *Effects of Superheating on the Castability and Physical Properties of Gray Iron*, by N. A. Ziegler and H. W. Northrup, Crane Co., Chicago, Ill.

3:00 PM *The Measurement of the Fluidity of Aluminum Alloys*, L. W. Eastwood, Aluminum Co. of America, Cleveland, O.

3:30 PM *Malleable Iron Castability Tests*, by E. J. Ash, University of Michigan, Ann Arbor, Mich.

4:00 PM Lecture Course—Session 2.

Elementary Metallurgy and the Use of the Microscope, by R. M. Allen, Bloomfield, N. J.

6:00 PM Engineering Instructors' Dinner.

6:00 PM Conference of Chapter Delegates—Dinner.

8:00 PM Refractories.

8:00 PM *Plastic Cupola Patching*, by R. E. Wilke, John Deere Tractor Co., Waterloo, Iowa.

8:45 PM *Refractories in the Steel Foundry*, by A. V. Leun, Bethlehem Steel Co., Bethlehem, Pa.

8:00 PM Time Study.

Practical Approach to Motion and Time Study, by G. J. Stegemerten, Time Study and Methods Dept., Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Wednesday, May 17

8:00 AM Gray Iron Shop Course—Session 3.

Chairman: K. H. Priestley, Eaton-Erb Foundry Co., Vassar, Mich.

Discussion Leader: J. A. Bowers, American Cast Iron Pipe Co., Birmingham, Ala.

Cupola Refractories and Figuring Mixes.

9:00 AM Gray Iron.

9:00 AM *Rapid Temperature Measurements of Cast Iron with an Immersion Thermocouple*, by F. Holtby, University of Minnesota, Minneapolis, Minn.

9:30 AM *Copper-Aluminum-Silicon Alloy Additions to Cast Iron*, by V. H. Schnee and T. Barlow, Battelle Memorial Institute, Columbus, O.

10:15 AM *Influence of Undercooling on the Graphite Pattern of Gray Iron*, by R. Schneidewind and C. D'Amico, University of Michigan, Ann Arbor, Mich.

9:00 AM Foreman and Apprentice Training.

9:00 AM *Foundry Apprentice Training—An Essential to Foreman Training*, by A. R. Luebke, Fairbanks Morse & Co., Beloit, Wis.

10:00 AM *A Foundryman's Approach to Foreman Training*, by W. G. Conner, Jr., Walworth Co., Greensburg, Pa.

9:00 AM Steel.

9:00 AM *High Alloy Steel Castings for Heat and Corrosion Resistance*, by Jas. Corfield, Michigan Steel Castings Co., Detroit, Mich.

9:30 AM *Report of Committee on Impast Tests.*

9:45 AM *Report of Committee on Radiography. Gamma-Ray Radiographic Standards of the U. S. Navy for Steel Castings*, by N. A. Kahn, New York Navy Yard, New York City.

10:30 AM *Copper as an Alloying Element in Some Cast Steels*, by C. T. Greenidge and C. H. Lorig, Battelle Memorial Institute, Columbus, O.

9:00 AM Sand Research.

9:00 AM *Properties of Resin Bonded Cores*, by Emile Pragoff, Jr., Hercules Powder Co., Wilmington, Del.

10:00 AM *Hot Strength and the Role of Break Down of Cores*, by H. W. Dietert, Harry W. Dietert Co,. Detroit, Mich.

11:00 AM Annual Business Meeting and Board of Awards Lecture.

2:00 PM Steel.

2:00 PM *A Rapid Method for Determining Carbon in Plain Carbon Steels for Control Purposes*, by H. H. Blosjo, Minneapolis Electric Steel Foundry, Minneapolis, Minn.

2:20 PM *Synthetic Bonded Steel Molding Sands*, by C. W. Briggs, Steel Founders' Society, Cleveland, and R. E. Morey, Naval Research Laboratory, Anacostia, D. C.

3:10 PM *A Discussion on Steel Castings Having High Mechanical Properties*, by George Delbart, Societe Francaise de Constructions Mecaniques, Paris, France. (Official Exchange Paper—Association Technique de Fonderie de France.)

3:30 PM *Report of Committee on Heat Treatment.*

3:40 PM *Report of Committee on Coupon Tests.*

2:00 PM Sand Research.

2:00 PM *Elements of Petrographic Study of Molding Sands*, by R. E. Grim, Illinois Geological Survey, Urbana, Ill.

2:40 PM *Mineral Composition and Textures of the Clay Grade of Molding Sand*, by C. E. Schubert, University of Illinois, and R. E. Grim, Illinois Geological Survey, Urbana, Ill.

3:20 PM *Report of Sand Research Committee.*

2:00 PM Foundry Costs.

Molding Costs—Committee Report.

Melting Costs—Committee Report.

4:00 PM Lecture Course—Session 3.

Elementary Metallurgy and the Use of the Microscope, by R. M. Allen, Bloomfield, N. J.

7:00 PM A.F.A. Annual Dinner.

Thursday, May 18

9:00 AM Gray Iron Shop Course—Session 4.

Chairman: J. A. Woody, American Cast Iron Pipe Co., Birmingham, Ala.

Cupola Operation, by John Lowe, Lansing, Mich.

10:00 AM Gray Iron.

10:00 AM *Influence of Composition on Electric Furnace Irons*, by R. G. McElwee, Vanadium Corp. of America, Detroit, and R. Schneidewind, University of Michigan, Ann Arbor, Mich.

10:30 AM *Some Factors in Hardening and Tempering Gray Cast Iron*, by G. A. Timmons, V. A. Crosby and A. J. Herzig, Climax Molybdenum Co., Detroit, Mich.

11:15 AM *Effects of Heat Treatment on Combined Carbon and Physical Properties of Cast Iron*, by S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.

9:30 AM Steel—Symposium on Melting Practices.

Acid Electric, by W. G. Finster, Reading Steel Castings Div., American Chain & Cable Co., Reading, Pa.

Basic Electric, by C. W. Briggs, Steel Founders' Society, Cleveland, O.

Basic Open Hearth, by J. W. Porter, American Steel Foundries, East Chicago.

Acid Open Hearth, by W. C. Harris, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

Converter, by F. B. Skeates, Link-Belt Co., Chicago.

Induction Furnace, by G. F. Landgraf, Lebanon Steel Foundry, Lebanon, Pa.

10:00 AM Pattern Making.

Some Pattern Making Problems, by J. A. Kolb, Caterpillar Tractor Co., Peoria.

12:30 PM Gray Iron Round Table Meeting—Luncheon.

12:30 PM Steel Division Round Table Meeting—Luncheon.

Deoxidizers

Discussion Leaders: C. E. Sims, Battelle Memorial Institute, Columbus, and A. P. Gagnebin, International Nickel Co., Bayonne, N. J.

Reduction of Silicon From Slag

Discussion Leaders: D. C. Zuege, Sivyer Steel Casting Co., Milwaukee, and H. H. Blosjo, Minneapolis Electric Steel Casting Co., Minneapolis, Minn.

2:00 PM Lecture Course—Session 4.

Elementary Metallurgy and the Use of the Microscope, by R. M. Allen, Bloomfield, N. J.

Third New England Regional Conference To Be Held at Massachusetts Institute of Technology

THE Third Regional Foundry Conference under the joint sponsorship of the New England Foundrymen's Association, the American Foundrymen's Association, and the Massachusetts Institute of Technology, will be held at the Massachusetts Institute of Technology, Cambridge, Mass., Friday and Saturday, April 14 and 15, 1939. The first two meetings have proved particularly attractive, indicating the worth whileness of these regional meetings in this district.

The purpose of this year's conference is to bring together engineers, metallurgists, and foundrymen for a free discussion of the problems encountered in the design and manufacture of castings. The third conference has been planned with extreme care, particularly with the thought in mind of permitting free discussion of the subject matter presented at the technical sessions. The subjects shown on the program have been chosen because of their fundamental importance and interest to those in attendance.

The Friday morning session will be devoted to the important subject of personnel problems. The first session of the afternoon program will cover in a practical as well as fundamental way the subject of spectroscopy as applied to foundry problems. The second session will be devoted to the important developments in high test cast irons.

The Saturday morning round table discussion deals with the subject of blended sands which is becoming an increasingly important phase of foundry practice. The first session of the afternoon will be on the very interesting subject of pressure bronze castings. The final technical session, pertaining to variables in the core room, will offer an excellent opportunity for discussion of a problem which confronts all foundrymen as well as designers and users of castings.

Program Schedule

Friday, April 14, 1939

9:00 AM Registration—Main Lobby, William Barton Rogers Bldg., Massachusetts Institute of Technology.

10:15 AM Opening Meeting.
Chairman: Charles O. Butler, Warren Pipe Co. of Mass., Inc., Everett, Mass.
Welcome by Dr. Karl T. Compton, president, Massachusetts Institute of Technology.

Main Educational Building, Massachusetts Institute of Technology, where New England Foundry Conference is to be held.

10:30 AM Luman S. Brown Session.
Chairman: E. H. Ballard, General Electric Co., Lynn, Mass.
"Personal Problems of the Modern Industrialist," by J. Edwin Doyle, director, Division of Unemployment Compensation, Commonwealth of Massachusetts.

12:30 PM Luncheon—North Hall, Walker Memorial.

2:00 PM Technical Session.
Chairman: Dr. Robert S. Williams, head of dept. of metallurgy, M.I.T.
"Applications of Spectroscopy to Foundry Problems," by Dr. George R. Harrison, professor of physics, M.I.T.

3:00 PM Technical Session.
Chairman: Walter M. Saunders, Jr., metallurgist, Providence, R. I.
"Recent Developments in High Test Cast Iron," by J. S. Vanick, research metallurgist, International Nickel Co., New York City.

6:00 PM Conference Dinner, North Hall, Walker Memorial.
Presiding: R. F. Harrington.
Address by Edward L. Moreland, dean of engineering, M.I.T.
Address by Henry S. Washburn, president, Plainville Casting Co., Plainville, Conn. Vice president of the American Foundrymen's Association.
"Foundries Around the World," by W. F. Piper, Beardsley & Piper Co., Chicago, Ill.

Saturday, April 15, 1939

10:00 AM Round Table Discussion.
Chairman: A. S. Wright, Hunt-Spiller Mfg. Corp., South Boston, Mass.
"Some Experiences With Blended Sands—Iron and Steel," Leader: D. L. Parker, General Electric Co., Lynn, Mass.

12:30 PM Luncheon.
Coffee Talk: "Commercial Aviation," by W. Nelson Bump, dist. sales mgr., American Airlines, Inc.

2:00 PM Technical Session.
Chairman: Juston A. Duncan, William Duncan Co., East Boston, Mass.
"Production of Pressure Bronze Castings," by D. Frank O'Connor, Walworth Co., South Boston, Mass.

3:00 PM Technical Session.
Chairman: LeRoy M. Sherwin, Brown & Sharpe Mfg. Co., Providence, R. I.
"Variables in the Core Room—Their Treatment and Cure," by L. P. Robinson, Werner G. Smith Co., Cleveland, O., and chairman, Northeastern Ohio Chapter, A.F.A.

Conference Committee

The committee on arrangements is again under the chairmanship of R. F. Harrington, foundry supt. and chief metallurgist, Hunt-Spiller Mfg. Corp., S. Boston, Mass. The vice chairman is Charles O. Butler, supt., Warren Pipe Co. of Mass., Everett, Mass. Serving with these men on the general committee are:

LeRoy M. Sherwin, foundry and pattern shop supt., Brown & Sharpe Mfg. Co., Providence, R. I.

D. L. Parker, director, foundry research & test div., General Electric Co., Lynn, Mass.

A. S. Wright, met., Hunt-Spiller Mfg. Corp., South Boston, Mass.

Profs. J. M. Lessells and P. E. Kyle, Massachusetts Institute of Technology.

R. G. Elphinstone, foundry supt., Westinghouse Electric & Mfg. Co., Springfield, Mass.

L. G. Tarantino, secretary, Connecticut Non-Ferrous Foundrymen's Ass'n, Bridgeport, Conn.

H. S. Washburn, Jr., secretary, Connecticut Foundrymen's Ass'n, Plainville, Conn.

Robert J. Nelson, president, New England Foundrymen's Ass'n and treasurer, Arcade Malleable Iron Co., Worcester, Mass.

A registration and reception committee has also been organized, this being composed of representatives of local foundry supply companies. The chairman of this committee is R. H. Rehm, Whitehead Bros., Providence, R. I., and the treasurer, T. C. Wilson, Republic Steel Corp., Boston.

In addition to the groups sponsoring the meeting, cooperating organizations are the local sections of the American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Society for Metals and the American Welding Society.

Detroit Chapter Sponsors Seventh Annual Foundry Conference at Michigan State College

April 14-15, East Lansing, Mich.

COOPERATING with the Engineering Department of Michigan State College, the Detroit Chapter is sponsoring the Seventh Annual Regional Foundry Conference to be held at East Lansing, Mich., Friday and Saturday, April 14 and 15.

This year's conference has been broadened in scope over those of previous years, offering papers and discussions of interest not only to the gray iron foundrymen but to the steel, malleable and non-ferrous foundrymen as well. All foundrymen and others interested in the casting of metals are invited to attend.

The chairman of the committee on arrangements is V. A. Crosby, Climax Molybdenum Co. Others on this committee are Ira F. Cheney, Griffin Wheel Co., Detroit, and chairman of the Detroit Chapter; Harry J. Deutsch, Aluminum Company of America, and chapter secretary; H. W. Dietert, Harry W. Dietert Co.; Fred J. Walls, International Nickel Co.; Fred A. Melmoth, Detroit Steel Casting Co., and Wayne L. Cockrell, Dept. of Metallurgy, Michigan State College.

I. F. Cheney

H. J. Deutsch

V. A. Crosby

Conference Committee Members

The conference as a whole is to be dedicated to a study of foundry factors affecting the castability of metals. Other features of the conference will be a session for the engineering students at which time they will be given talks on "Metal Castings in Industry." This student session is being held as it is realized that the foundry industry has many developments of recent years about which it can talk with pride. The program for the general technical sessions follows:

Technical Program-Castability Conference

Factors which affect the casting of metals are considered under two headings—(1) "External Influences" and (2) "Internal Reactions."

Friday, April 14

8:45 AM Registration—Engineering Bldg., Michigan State College Campus.

9:30 AM Opening meeting—address of welcome—John Hannah, Secy., State Board of Agriculture.

9:45 AM External Influences—A—Mechanical Equipment.

Chairman: Fred J. Walls, International Nickel Co., Detroit.

(a) *"Effect of Superheat on Castability and Physical Properties of Gray Iron,"* by N. A. Ziegler and H. W. Northrup, Crane Co., Chicago.

(b) *"Methods of Controlling Directional Solidification of Metals,"* by Fred A. Melmoth, Detroit Steel Casting Co., Detroit.

12:30-1:45 PM Luncheon—Union Bldg.

2:00 PM External Influences—B-Sand Properties.

Chairman: Jesse L. Stoddard, Detroit Testing Laboratory, Detroit.

(a) *"The Relation of Sand Characteristics to the Shrinkage and Cooling Rates of Gray Iron Castings,"* by H. L. Womochel and C. C. Sigerfoos, Michigan State College, Metallurgical Dept.

(b) *"A Review of Sand Characteristics on Alloying Additions and Melting Practices on Castability of Aluminum Alloys,"* by W. E. Sicha, Aluminum Company of America, Detroit.

(c) *"Chill, Strength, Fluidity and Shrinkage Characteristics,"* by Harry W. Dietert, H. W. Dietert Co., Detroit.

4:00 PM Special Student Session—"Metal Castings in Industry."

Chairman: Harry J. Deutsch, Metallurgist, Aluminum Company of America, Detroit.

(a) *Cast Iron*—Fred G. Sefing, International Nickel Co., New York City.

(Program Continued on Page 9)

View of Michigan State Campus With Engineering Building in Right Background Where Conference Sessions Will Be Held

New Members

Converted from Limited Firm to Company Membership

American Rolling Mill Co., Middletown, Ohio.
Crouse-Hinds Co., Syracuse, N. Y.
Hill & Griffith Co., Cincinnati, Ohio.
International Heater Co., Utica, N. Y.
Stedman's Foundry & Machine Works, Aurora, Ind.

Company Members

Buckeye Foundry Co., Cincinnati, Ohio, (R. J. Redmond, Sec'y-Treas.).
Chapman Valve Mfg. Co., Indian Orchard, Mass., (Andrew T. Sproat, Supt. Foundry).
Corn Products Sales Co., New York, N. Y., (Frank G. Faller, Jr., Foundry Technician).
H. P. Deuscher Co., Hamilton, Ohio, (Earl H. Thompson, Treas.).
Kaukauna Machine Corp., Kaukauna, Wis., (W. H. Roloff, Gen. Mgr.).
Wm. Powell Co., Cincinnati, Ohio, (William Heilig).
Ranson & Orr Co., Cincinnati, Ohio, (Delvin Orr, Vice Pres.).
Reliable Pattern & Casting Co., Cincinnati, Ohio, (E. T. Korten, Pres.).
Reliance Foundry Co., Cincinnati, Ohio, (Frank Hutchinson, Vice Pres.).
Rochester Smelting & Refining Co., Rochester, N. Y., (Irving B. Rosenthal, Sec'y).
St. Mary's Foundry Co., St. Mary's Ohio, (Chas. E. Dine, Mgr.).
Superior Pattern Co., Cincinnati, Ohio, (Robert Frankl, Pres.).
Wheeling Steel Corp., Wheeling, W. Va., (Dr. F. F. Foss, Director of Res. & Met.).
Williams Bros., Inc., Elkhart, Ind., (U. S. Williams, Sec'y-Treas.).

Personal Members

Harmon W. Arnold, Chicago, Ill., Asst. to Vice Pres. Griffin Wheel Co., Chicago, Ill.
Paul S. Ashbaugh, Salesman, The Lunkenheimer Co., Cincinnati, Ohio.
John H. Bemis, Salesman, Pickands, Mather & Co., Chicago, Ill.
A. Samuel Berlin, Chief Chemist, American Manganese Steel Co., Wilmington, Del.
Stephen Blackford, Foundry Supt., Crouse-Hinds Co., Syracuse, N. Y.
Carlton E. Brown, Plant Engineer, The Cincinnati Milling Mach. Co., Cincinnati, Ohio.
J. D. Buckley, Sales Rep., Abrasive Co., Milwaukee, Wis.
E. N. Carlson, Salesman, Chicago Pneumatic Tool Co., St. Louis, Mo.
Gerald M. Cover, Assoc. Prof. of Metallurgy, Case School of Applied Science, Cleveland, Ohio.
Gordon C. Creusere, Metallurgist, Kelsey-Hayes Wheel Co., Detroit, Mich.
J. M. Dannelly, Jr., V. P. in Charge of Sales, National Cement Co., Birmingham, Ala.
R. E. Davis, Salesman, Corn Products Sales Co., Cleveland, Ohio.
Chas. S. Dold, Asst. Mgr. Coke Sales, Wheeling Steel Corp., Cincinnati, Ohio.
L. C. Dunn, Sales, E. F. Houghton & Co., Detroit, Mich.
Walter Ebersold, Foreman, The Reliable Pattern & Castings Co., Cincinnati, Ohio.
Edward W. Ehlerding, Asst. Fdry. Foreman, The Lunkenheimer Co., Cincinnati, Ohio.
Peter J. Feichtner, Supervisor, Cincinnati Milling Mach. Co., Cincinnati, Ohio.
Frank Feola, Supt. Non-Ferrous Fdry. Crouse-Hinds Co., Syracuse, N. Y.
Frederick C. Foster, Foreman Wheel Fdry., Southern Pacific Co., Sacramento, Calif.
Don Goddard, Foreman, Michiana Products Corp., Michigan City, Ind.
Walter F. Haggman, Mgr., Foundry Specialties Co., Huntington Park, Calif.
Clay P. Hellwig, Dist. Mgr., Kerchner Marshall & Co., Cleveland, Ohio.
Harold Wm. Hershey, Teacher, Vocational High School, Syracuse, N. Y.
Charles R. Hilb, Dist. Sales Mgr., H. Kramer & Co., Cincinnati, Ohio.
Bruce Hill, Sales Mgr., The Hill & Griffith Co., Cincinnati, Ohio.
H. W. Kautz, Fdry. Foreman, Cincinnati Milling Mach. Co., Cincinnati, Ohio.
Albert Wm. Klausing, Pattern Foreman, Cincinnati Milling Mach. Co., Cincinnati, Ohio.
Joseph W. Kock, Supv., Cincinnati Milling Machine Co., Cincinnati, Ohio.
Joseph G. Kropka, Supv., Chain Belt Co., Milwaukee, Wis.
Edwin Kruck, Maynard Electric Steel Casting Co., Milwaukee, Wis.
Arthur Kuhn, Sec'y-Treas., The Reliable Pattern & Castings Co., Cincinnati, Ohio.
Wallace Lewis, Foreman (Non-Ferrous), The Lunkenheimer Co., Cincinnati, Ohio.
B. B. Mason, Dist. Rep., E. F. Houghton Co., Davenport, Iowa.

R. L. McIlvaine, Sales Mgr., Swayne, Robinson & Co., Richmond, Ind.
W. G. McKee, Salesman, Republic Steel Corp., Cleveland, Ohio.
James E. McSurely, Core Rm. Foreman, Cincinnati Milling Mach. Co., Cincinnati, Ohio.
Wm. F. Morris, Jr., Salesman, General Refractories Co., Philadelphia, Pa.
Ray Munson, Pattern Maker, Maynard Electric Steel Castings Co., Milwaukee, Wis.
Lawrence N. Naberhaus, Ind. Eng., Cincinnati Milling Mach. Co., Cincinnati, Ohio.
Charles Arthur Nagler, Student, University of Michigan, Ann Arbor, Mich.
Chas. M. Parsons, Fdry. Foreman, Homestake Mining Co., Lead, S. D.
John W. Porter, Works Mgr., American Steel Foundries, East Chicago, Ind.
H. F. Randolph, Vice Pres., International Heater Co., Utica, N. Y.
Allen J. Reid, Salesman, General Refractories Co., Milwaukee, Wis.
Arthur Remers, Foreman, The Reliable Pattern & Castings Co., Cincinnati, Ohio.
Charles M. Romanowitz, Sales Mgr., Yuba Mfg. Co., San Francisco, Calif.
Dominic Saviano, Pres., Junior Foundrymen of America, Chicago, Ill.
E. C. Sawyer, Sales Engineer, The Ayers Mineral Co., Zanesville, Ohio.
V. H. Schnee, Research Engineer, Battelle Memorial Institute, Columbus, Ohio.
Joseph S. Schumacher, Supv., Cincinnati Milling Mach. Co., Cincinnati, Ohio.
Louis Smanda, Patt. Foreman, Studebaker Corp., South Bend, Ind.
A. J. Troja, Supt. Griffin Wheel Co., Los Angeles, Calif.
Edward Weatherford, Naval Stores Dept., Hercules Powder Co., Decatur, Ill.
Lionel Werner, Foreman Patt. Maker, Crouse-Hinds Co., Syracuse, N. Y.
Wm. C. Wick, Sec'y, Junior Foundrymen of America, Chicago, Ill.
Frank M. Willeson, Salesman, The Ajax Metal Co., Syracuse, N. Y.

Foreign Members

J. S. Douchement, Sec'y, Gen. Bureau International de l'Aluminium, Paris, France.
Frank Ellis, Principal, Melbourne Technical College, Melbourne, Australia.
Nuri Killioglu, Zeytinburnu Demir Esya Fabrikasi, Istanbul, P. B. Turkey.
William Walsh, Dept. of Met. & Mining, Melbourne Technical College, Melbourne, Australia.

Detroit Chapter Sponsors 7th Annual Conference at East Lansing

(Continued from Page 7)

(b) *Non-Ferrous Castings*—A. C. Wheat, Aluminum Company of America, Detroit.

(c) *Steel Castings*—Fred A. Melmoth, Vice President, Detroit Steel Castings Company, Detroit.

7:00 PM Banquet.

Toastmaster—Pat Dwyer, Engineering Editor, THE FOUNDRY, Cleveland.

"Science and Criminal Justice," by John S. Bugas, Special Agent, Federal Bureau of Investigation.

Saturday, April 15

9:00 AM Internal Reactions.

Chairman: V. A. Crosby, Climax Molybdenum Co. of Michigan, Detroit.

(a) *"Review of Factors Affecting Fluidity of Metals,"* by W. H. Spencer, Met., Sealed Power Corp., Detroit.

(b) *"Effect of Raw Material Characteristics on Castability of Metals,"* by John Lowe, Lansing, Mich.

(c) Symposium—Effect of Alloying Elements.
"Low, Medium & High Concentration Effects," by E. K. Smith, Electro Metallurgical Corp., Detroit.
"Castability of Alloy Steel Castings," by R. J. Wilcox, Michigan Steel Casting Co., Detroit.
"Ladle Treatments by Graphitizers and Deoxidizers," by R. G. McElwee, Vanadium Corp., Detroit.

1:30-2:30 PM Luncheon.

2:30-4:30 PM College Demonstrations.
Demonstration of Crystallization as Influenced by Contour, by M. S. C. Staff.
Demonstration of Polarized Light to Show Stree Concentration, by M. S. C. Staff.
Demonstration of Student Operation of a Foundry —Cupola and Induction Furnace Melting, by M. S. C. Freshmen and Staff.

Pat Dwyer

E. K. Smith

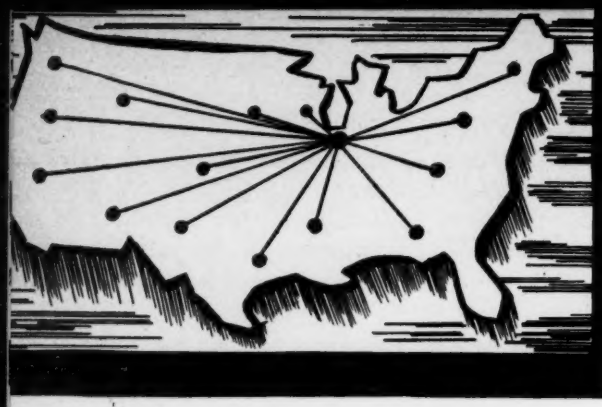
J. D. Stoddard

R. G. McElwee

W. H. Spencer

F. A. Melmoth

Some Speakers and Chairmen of East Lansing Conference



Chapter Activities

Birmingham Conference Breaks Attendance Record for Regional Meetings

By W. O. McMahon*, Birmingham, Ala.

THE Seventh Annual Southern Foundry Conference, held at the Hotel Tutwiler, Birmingham, set an all-time record for attendance at regional foundry conferences with a registration of 686. This year this conference, started in 1931, was held Thursday and Friday, March 23 and 24, and was arranged entirely by the Birmingham Chapter, A.F.A. In previous years it had been held as a joint meeting with the Birmingham Section of A.S.M.E.

This year's conference was considered by those attending as one of the most successful of the series which is drawing attendance from a wide range and becoming noted as the big annual southern foundry meeting.

Highlights of the conference were six technical sessions, an extensive and well organized plant visitation, a luncheon on Thursday and the annual banquet on Friday evening at which 467 were present. The plant visitation proved especially attractive, being ably handled by the plant visitation committee under the chairmanship of R. L. Ogden of the Stockham Pipe Fittings Co. Groups were made up to visit the different plants, and many new and interesting things were seen in many of the plants open for inspection.

Under the direction of the chapter, of which C. B. Saunders, Tennessee Coal, Iron and R. R. Co., is Chairman, the various activities of the meeting were arranged by committees. The Vice Chairman of the chapter is R. C. Harrell and the Secretary-Treasurer, W. O. McMahon. The committees and their chairmen were: Program—W. E. Jones; Publicity—Tom Benners, Jr.; Registration—Aubrey White; Entertainment—William Oberhelman, chairman, and R. R. Deas, vice chairman; Membership — A. S. Holberg.

*Chief Foundry Metallurgist, Sloss-Sheffield Steel & Iron Co., and Secretary-Treasurer, Birmingham Chapter.

Birmingham Conference Luncheon Group

C. B. Saunders presided at the first session, welcoming the conference visitors. W. E. Curran, Sloss-Sheffield Steel & Iron Co., was chairman of the first technical session which was devoted to a discussion of the paper — "Blast Furnace Production of Foundry Pig Iron," by C. W. Lawson of the same company. This meeting was followed by the annual luncheon given in honor of the speaker, with Karl Landgrebe, Vice President, Tennessee Coal, Iron & R. R. Co., presiding. L. P. Robinson, Werner G. Smith Co., Cleveland, and Chairman, Northeastern Ohio Chapter, was the guest speaker.

Under the chairmanship of S. J. Price, Birmingham Stove & Range Co., one of the afternoon sessions was devoted to a paper by D. B. Noland, Gray & Dudley Co., Nashville. Mr. Dudley discussed the relation of cast iron composition to pin holes and blistering of porcelain enameling. At the second afternoon session, A. H. White, Stockham Pipe Fittings Co., discussed "Job Evaluation," with W. J. Cotlin, American Cast Iron Pipe Co., presiding.

A third afternoon session was for the non-ferrous foundrymen. Dr. Jas. T. MacKenzie, American Cast Iron Pipe Co., presided, while J. W. Kelin, Federated Metals Div., American Smelting & Refining Co., St. Louis, presented a paper on "Selection and Uses of Non-Ferrous Alloys."

As Friday morning was devoted to plant visitation, the first Friday technical session was held in the afternoon with the chairman, J. E. Reynolds, U. S. Cast Iron Pipe Co., directing the discussion of a paper on "Facings and Core Washes," by E. G.

Aerial View of American Cast Iron Plant—Visited on Birmingham Conference Plant Inspection Program

Klumb, Hill & Griffith Co., Cincinnati. The second Friday session was opened at 3 p. m. with J. M. Franklin, Central Foundry Co., presiding, and Pat Dwyer, Engineering Editor, *The Foundry*, Cleveland, O., presenting a series of slides to illustrate his comments on "The Application and Function of Gates and Risers in the Production of Castings."

Friday evening the conference guests assembled for the annual banquet. After being served with a delightful dinner, Chapter Chairman Saunders called the meeting to order, announcing the record-breaking attendance. He introduced as toastmaster W. Carson Adams. After Mr. Adams introduced those at the speakers' table, he presented as guest speaker Donald B. Gilles, Vice President, Republic Steel Corp., Cleveland. The subject of Mr. Gilles' address, which was thoroughly appreciated by those present, was "Business Men Are Needed in Politics." He reviewed briefly the history of American business of the past decade or two and emphasized the fact that business men, if we are to continue to enjoy our present form of government, must become interested in politics, even down to the precinct and district organizations. His talk contained many pertinent points and much food for thought.

St. Louis District Holds March Meeting

By J. W. Kelin*, St. Louis, Mo.

THE third meeting of the year of the St. Louis District chapter was held March 9 at the York Hotel. Vice chairman L. E. Everett, Key Company, presided at the meeting following the usual dinner. He first introduced two new members of the chapter, Messrs. E. M. Carlson of the Chicago Pneumatic Tool Company, and Lee H. Horneyer of the Cleveland Pneumatic Tool Co. Following this, visitors of the evening were then presented to the group.

After routine business matters were disposed of, chairman Everett directed special attention to the coming fall conference to be held October 5, 6, and 7 at the Hotel Jefferson in St. Louis. L. Desparois, chairman of the conference committee, outlined in some detail plans for one of the most elaborate conferences ever given by the chapter to date.

The program committee chairman, Webb Kammerer, announced that plans had finally been completed for the Kansas City extension meeting to be held at the President Hotel in Kansas City on Friday evening, April 21. This is part of the St. Louis chapter's efforts to increase interest and membership in A.F.A. in an outlying chapter territory.

Bruce E. Braun, vice president in charge of operations for the Chicago and Southern Airlines, Inc., was then introduced as the first speaker of the evening. Mr. Braun delivered his well-known talk, "Rails of the Air," outlining a very original and interesting manner of operation method and rules for various air lines giving emphasis to radio theme.

Following this talk the Crane Company's picture "Flow," outlining the foundry and other operations of the Crane Company, was displayed to the group. Considerable interest was manifested by the entire chapter in this well presented movie.

*Federated Metals Div., A. S. & R. Co., and Secretary, St. Louis Chapter.

Detroit Chapter Hears Reese on Cupola Practice

By Harry J. Deutsch*, Detroit

THE Detroit Chapter held its March meeting on Thursday, March 16, at the Fort Shelby Hotel with some 90 members and guests present. The speaker for the evening was Donald J. Reese, development engineer for the International Nickel Co., New York. His subject was "Cupola Charging and Control Methods." With the use of slides Mr. Reese illustrated the various zones in a cupola and also the various equipment necessary to operate a cupola. He explained in detail the purpose of each zone in the cupola and gave his recommendations for the proper operation of the cupola to produce the most satisfactory iron.

He particularly stressed the point of thoroughly preheating all ladles so as not to cool the iron too much before it reaches the mold. He said that with proper operation of a cupola that iron could be produced at a temperature of above 2800°F., but that with cold or improperly heated ladles the temperature would be reduced 400°F. or 500° F. by the time it reached the mold. He stated that regardless of the quantity of iron produced in a cupola, a flux should always be used in order to produce a layer of slag over the liquid iron. This cover of slag serves two

*Aluminum Company of America and Secretary, Detroit Chapter.

purposes, one to remove non-metallic inclusions from the molten iron passing through the slag and the other to prevent a temperature drop of the iron below the cover of slag.

Mr. Reese further stressed the importance of controlling blast pressures in order to produce the maximum amount of iron in the cupola without excess air which would tend to cool the iron as it passes through the tuyere zone. The talk was very interesting to all members present, as it brought out a great many questions, and the meeting did not adjourn until eleven o'clock.

Immediately after dinner as a special feature, R. B. Crawford, Atlas Foundry Co., Detroit, and past chairman of the chapter, showed four reels of motion pictures which he had taken during his trip to California last winter. These pictures were in color and were mostly of the scenery through Arizona and at the Grand Canyon and were very interesting to those present.

L. L. Andrus, Secretary
Michiana Chapter

Michiana Chapter Conducts Double Feature Meeting

THE March meeting of the Michiana Chapter continued the excellent attendance record of this recently organized chapter with about 150 present from a widespread area. The meeting was held at the Hotel Oliver, South Bend, on the evening of March 15, with Martin Lefler, chapter chairman presiding. Following the dinner, Chairman Lefler introduced the two speakers—Donald J. Reese, engineer, International Nickel Co., New York, and Wm. George, foundry engineer, R. Lavin & Sons, Chicago. Following the introductions the non-ferrous members adjourned to a second meeting room, with George Stoll, Bendix Products Co., presiding, where Mr. George gave a discussion on practical factors in brass and bronze foundry operations. His talk covered effects of pouring temperature, oxidizing and reducing conditions in melting, operation of various types of furnaces and other shop practices.

Mr. Reese, in his talk before the ferrous group, presented his views on the fundamentals of cupola operation, taking up in detail the relationships of coke sizes, blast pressures and volume, bed heights, charge sizes, stock sizes, cupola construction and other factors affecting melting practices and results. In the discussion which followed many questions were asked and answered relative to specific problems of those present.

It was announced that the April meeting would be held at the Hotel Oliver on April 25, with the speaker being L. P. Robinson, Werner G. Smith Co., Cleveland. His subject will be "Core Room Problems and Practices."

George B. Stoll, Chairman
Program Committee
Michiana Chapter

No. California Holds Non-Ferrous Meeting

THE Athens Club, Oakland, was the place of the March 10 meeting of the Northern California chapter. Chapter vice chairman S. D. Russell, Phoenix Iron Works, Oakland, presided in the absence of chairman J. D. Fenstermacher. Certain chapter business was first taken up and Fred Twinning of Fresno was introduced. He presented an urgent invitation to the members to participate in the April 22 meeting at Fresno at which time the Southern California Chapter joins with the Northern California Chapter to hold an all-day get-together and evening conference. Chas. Hoehn, national director, discussed the annual convention to be held in Cincinnati in May.

The meeting was then turned over to Fred Mainzer, Pacific Brass Foundry Co., chairman of the chapter non-ferrous committee. Mr. Mainzer presented P. W. Schumacher, Pacific Electric Mfg. Co., who discussed "Cost of Melting Non-Ferrous Metal in an Electric Furnace." He was followed by Max Greenhow, Federated Metals Corp., who talked on "Selection of Metal for Different Types of Non-Ferrous Castings." Then the secretary read a very interesting account of the "Sir Francis Drake Plate," prepared by Fred De Sanno of the De Sanno Foundry and Machine Co.

Mr. Mainzer, after discussing "Advancements Made in the Use of Well Chosen Alloys," summed up what the previous speakers had said. A. F. Mainzer, the chairman's father, next gave a very informative account of his experiences in statue molding.

Cincinnati District Chapter Completes Organization

GEORGE SEYLER, Lunkenheimer Co., and director of A.F.A., presided as organizing chairman at the meeting of the Cincinnati District Chapter, March 14. At this meeting, which was held at the Gibson Hotel, there was an attendance of some 120 members and guests. Guests introduced were Frank Steinebach, editor, *The Foundry*, Cleveland, O., and C. E. Hoyt, executive vice president, American Foundrymen's Association, Chicago.

In opening the meeting, Mr. Seyler announced that since the February meeting, the board of directors had elected the following officers:

Chairman: Herman K. Ewig, foundry supt., Cincinnati Milling Machine Co.

Herman K. Ewig
Chairman, Cincinnati District Chapter

Vice Chairman: H. J. McFarlin, foundry foreman, Lunkenheimer Co.

Secretary: E. T. Korten, president, Reliable Pattern & Castings Co.

Treasurer: Robert Frankl, president, Superior Pattern Co.

Directors serving with the above named officers to complete the board are as announced:

W. M. Ball, Jr., general supt., Edna Brass Mfg. Co.

E. F. Loges, secretary-treasurer, Kramer Bros. Foundry, Dayton.

Chester Peebles, treasurer, Stedman's Foundry & Machine Works, Aurora, Ind.

R. J. Redmond, secretary, Buckeye Foundry Co.

Earl Thompson, treasurer, H. B. Duecher Co., Hamilton.

After the introduction of the newly-elected officers Mr. Seyler turned the meeting over to chapter chairman Ewig who briefly but very aptly expressed his appreciation of the honor of being elected first chairman of the chapter, and expressed some views as to the chapter possibilities. He then presented the other officers and introduced the speaker of the evening, S. C. Massari, research metallurgist, Association of Manufacturers of Chilled Car Wheels, Chicago.

Mr. Massari first showed the film, "The Story of Chilled Car Wheels" as developed by his association to present the technical and shop practices involved in the making of improved chilled iron car wheels. Mr. Massari then gave his technical talk on "Controlled Cupola Operation by Controlled Blast," describing a development which had bettered melting operations in the foundries of the association.

E. F. Loges
Director, Cincinnati District Chapter

Southern California Holds Joint Meeting with A.S.M. Chapter

By M. S. Robb*, Los Angeles, Calif.

ON February 16, the Southern California Chapter held a joint meeting with the local chapter of the American Society for Metals. The meeting was at the Los Angeles Athletic Club, and presiding was J. G. Coffman, Los Angeles Steel Casting Co., and G. C. Stetter, Bethlehem Steel Co., chairman of the A.F.A. and A.S.M. chapters respectively. A large turnout of some 200 members of the chapters were present at this, the first joint meeting of these two organizations.

"Aluminum: Mine to Metal," "Aluminum Fabricating" and "The Story of Chilled Car Wheels" featured the program

*Bethlehem Steel Co., and Secretary, Southern California Chapter.

E. T. Korten
Secretary

Bruce Hill
Chairman, Convention Finance Committee

C. A. Peebles
Director

Officers Cincinnati District Chaper

of the evening, which was designed to be of mutual interest to the two groups.

E. C. Carlson of the Aluminum Company of America presented the program on aluminum, which included the showing of a motion picture—"Aluminum: Mine to Metal"—which described the mining of bauxite, the manufacture of alumina, and the production of aluminum. Another picture — "Aluminum Fabricating Processes"—depicted in detail the processes by which the metal is rolled, drawn, extruded, cast and forged.

A. J. Troja, superintendent, Los Angeles division, Griffin Wheel Co., addressed the meeting prior to the showing of a motion picture entitled — "The Story of Chilled Car Wheels." This picture, produced by the Association of Manufacturers of Chilled Car Wheels, described the manufacture and metallurgy of the chilled car wheel.

Metropolitan New York-New Jersey Chapter Hears Talk on Randupson Process

By T. J. Wood*, Mahwah, New Jersey

DONALD J. REESE, International Nickel Co., and chairman of the chapter, presided at the March 6 meeting of the Metropolitan New York-New Jersey Chapter. The meeting, which was held at the Essex House, Newark, N. J., was attended by some 60 members. Chairman Reese announced the appointment of a nominating committee to consist of Messrs. Clark, Crucible Steel Co., Harrison, N. J.; Moyer, Otis Elevator Co., Yonkers, N. Y., and Sefing, International Nickel Co., New York City.

The speaker of the evening, H. F. Scatchard, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., was then introduced, his subject being—"The Randupson Process of Cement Molding."

Mr. Scatchard's talk was generously illustrated both by slides and motion pictures. Convincing evidence was presented regarding the advantages of the process. It was interesting to note that for gray iron and nonferrous castings the molds are brushed with graphite in order to improve the surface appearance. Mold permeabilities range from about 80 to 120. A large part of the cemented sand is salvaged from the shake-out to be used in the form of rubble for building easily collapsible sections in new molds. Because of the natural hardening action of the cemented sand as well as the low free water content, a wide latitude in ramming is permissible without deleterious results. The discussion which followed Mr. Scatchard's address gave ample evidence of the keen interest held in the subject he so ably presented.

*American Brake Shoe & Foundry Co., and Secretary, Metropolitan New York-New Jersey Chapter.

Buffalo Considers Shrink and Contraction of Metals

By J. R. Wark*, Buffalo, N. Y.

THE March 13 meeting of the Buffalo Chapter was held at the Hotel Touraine. The meeting and dinner were well attended, with 85 present when the meeting was called to order by chapter chairman M. W. Pohlman, Pohlman Foundry Co. In opening the meeting, chairman Pohlman announced that the April meeting would be National President Night with President Marshall Post presenting a talk on cement molding.

In introducing the speaker of the evening, Mr. Pohlman presented C. W. Briggs, technical director, Steel Founders' Society of America, Cleveland. Mr. Briggs, who spoke on solidification, shrinkage and contraction of metals, was well qualified to speak on this subject, through his work at the U. S. Naval Research Laboratory as physical metallurgist. Mr. Briggs, who in 1937 was awarded the A.F.A. William H. McFadden Gold Medal, gave some very interesting data on solidification and contraction, considerable of which has appeared in A.F.A. *Transactions* and in papers presented by Mr. Briggs and his associates. The information presented was appreciated, as it was given in language familiar to foundrymen.

*Queen City Sand & Supply Co., and Secretary, Buffalo Chapter.

St. Louis Chapter to Hold Special Meeting at K. C.

FOLLOWING the precedent set last year, the St. Louis District Chapter is planning a meeting for April 21 at Kansas City for the benefit of the members in that territory who cannot attend regularly the meetings held at St. Louis. Last year's Kansas City meeting proved very popular, there being some 130 present, and it is expected that an equally good or better attendance will be secured this year.

The speaker for this year's meeting will be C. R. Culling, Carondelet Foundry Co., St. Louis, who will talk on "General Foundry Practice in a Specialty Jobbing Foundry." The chairman of the meeting will be A. O. Nilles, Griffin Wheel Co., Kansas City. The following will serve on a committee on arrangements: Ed Akers, Locomotive Finished Material Co., Atchison; V. A. Birtsch, American Brake Shoe & Foundry Co., Kansas City, and Wm. Conrad, Oklahoma Iron Works, Tulsa, Okla.

Mr. Culling, the speaker of the evening, is especially well known throughout the gray iron industry, being an outstanding producer of jobbing electric furnace castings. He recently was nominated for a place on the A.F.A. Board of Directors and is president of the Gray Iron Founders' Society of America.

Safety

Chains in the Foundry

H. A. Delano,* York, Pa.

ALTHOUGH the industry of chain manufacturing is extremely old, and uses of chain as a carrying medium date back to our earliest evidences of civilization; nevertheless, in recent years much interesting information relative to the manufacture and service expected from this ancient product has been brought out by modern engineering and research.

Manufacture and Types

Not so many years ago chain was purchased by the cask, and its material size and length furnished its only necessary specification. In those days, if metallurgy was even thought of by chain users, it was a much too dignified science to be used on chain selection; and, if there were any safety engineers, they were thinking mostly of details of construction, pressure vessels, etc.. and little or no attention was given to the hazards of chain failures. Much was left to costly experience, and sometimes to lasting memories of fatal accidents, in the chain selection of the earlier days. As a result of this type of selection, iron was chosen as a material most suitable for chain purposes. This logical solution was based on the fundamental and inherent characteristics of iron to withstand general abuse, and also on the fact that in itself it offered the most weldable material in the higher strength, lower cost metal field. Iron chains, as made by any of the reliable chain manufacturers, are still and for sometime will be held in high favor on account of their long proven reliability and dependability of service.

Chains manufactured from iron are welded by the forged end weld process, and during the past few years, like all other industries, chain makers have improved both their facilities and technique to a point where the user now instead of buying physical specifications in size, feet, and pounds today buys tensiles, yield point, ductility, and service.

Electrical welding, a process almost entirely developed within this generation, has also left its mark on the chain industry. Steels and alloys hitherto impossible to weld are now listed by leading manufacturers, all brought about by this new art, and its accuracy of both temperature and mechanical control. During the development of electric welding of chains, it was quite to be expected that in the early stages all chain was welded on the side, due largely to the fact that the weld on the side was not called upon to carry the entire load on the chain, and quality chain could be manufactured with 75 to 80 per cent welds. With modern equipment 100 per cent welds are offering no great problem to present-day manufacturers, who have taken advantage of the recent welding control facilities developed within recent years.

Restrictions in Use

While the straight tensiles, elongation characterisitics, and general ability to withstand abuse in service of side weld chain has been up to all expectations, there has been rightly a tendency, and in some companies a definite policy, to restrict its use to places where life and property were not endangered by failure. This restriction is based on the entire lack of ability of the weld area to withstand a bending of even a small percentage of the amount which the parent metal from which the chain is manufactured can endure. In lifting materials having sharp corner or projections, the links of the chain are subjected to a decisive bending action, and the reverse bending of the same links is frequently disastrous. The shortening of the links in the chain design tends to correct this fundamental weakness of side welded chain, but in no way completely removes the hazard of early or unexpected failures from this cause.

Recognizing this feature, one of the leading chain manufacturers has developed an electrically end welded chain, taking advantage of the modern controls in the process of electric chain manufacture, from various alloys especially adapted for almost any type of service. The end weld chain, which naturally eliminates all possible bending in the weld area, and completely shields the weld from abuse, can be obtained from materials ranging in Brinell hardness from 100 to 275 with ductilities measured by elongation up to as high as 40 per cent, more or less proportionate to the hardness of the material. Stainless steel, Monel metal, and acid bronze for ornamental or chemical process plants are also available in most of the popular sizes and specifications.

Servicing

With the development of the design and process of welding iron, steels, and alloys has also come

*Chief Engineer, American Chain Division of the American Chain and Cable Company, Inc.

a study of proper servicing these products. Due to the lower yield point of iron, as compared with steel and alloys, the tendency of so-called "work hardening" of iron is more apparent than with the other listed materials. In the interest of safety and economy it is, therefore, recommended that all iron chains be periodically inspected.

Abuse can be detected by gauging the chain to determine if it has been overloaded. On highest grade chain this can almost be detected by visual inspection, as the link should have a rounded side, and, if the sides have become flattened, the chain has been subjected to a greater load than specified in the manufacturer's safe load table.

Cold working is greatly aggravated by operating chains above their appreciable yield point, and conversely can be reduced by operating at lower load values. Unless there are adequate facilities in the user's plant for the purpose of stress relieving at a temperature of 1350° F. and replacing damaged links in cold worked and worn chain, it is strongly recommended that they be returned to the manufacturer for this purpose. Without any doubt, frequently chains are damaged more by improvised repairing than by actual usage.

Steel chains developed for sling purposes should all be normalized at the manufacturer's plant, and, when operated on the safe loads recommended, are much less liable to cold working than iron. In the interest of safety, all sling chains should be thoroughly inspected at frequent and definite intervals for evidences of overload and damage to their component parts. If cold working does develop due to high loadings, stress relieving is possible and quite satisfactory at temperatures ranging from 1650° to 1700° F. Repairs are more difficult than with iron, as the welding must be done under more exacting conditions, and not attempted by any mechanic without experience in this type of welding if quality work is to be expected.

Heat treated higher carbon steels, welded electrically on the end of the link, have due to their higher tensiles and yield point characteristics less tendency to cold working. Visual inspection for damage and gauging detection of overload are recommended as the only attention necessary for this type of chain. Annealing or stress relieving should, under no circumstances, be attempted by any other than highly trained and experienced metallurgists, and welding can only be done on exactingly controlled electric chain welders if the chain manufacturers' standards are to be maintained on repaired slings.

On alloy chains, developed for industries where hardness and resistance to abrasion is of paramount importance, the sacrifice of high degrees of ductility must be made. Chains possessing these characteristics, together with their ability to withhold their physical qualities at moderately elevated temperatures, are somewhat less susceptible to cold working than other types above mentioned. With this material it is far more emphatic that any repairs found necessary by periodical inspection should be made by the chain manufacturer, as the welding and heat treating should never be attempted by any other than experienced men on specially designed equipment for this purpose.

Relative to the corrosion resisting chains, such as stainless steel, used in and around nitric acid, and Monel metal and acid bronzes recommended for hydrochloric and sulphuric acid installations, much has been written by the manufactures of these materials. Since the electric butt welding is accomplished without the addition of any foreign material—carbon, flux, welding rods, etc., the alloy manufacturers' claim can be followed with adequate assurance of serviceability. As this material is usually used in and around hazardous work, such as pickling, etc., a very close inspection should be made of the defects caused by external damage and the ravages of the pickling bath. No other attention is needed, and, depending upon the loading, chains should be discarded and replaced when interlink wear or corrosion has reached a point at which it is considered as unsafe for future service.

Impact Loadings and Misapplications

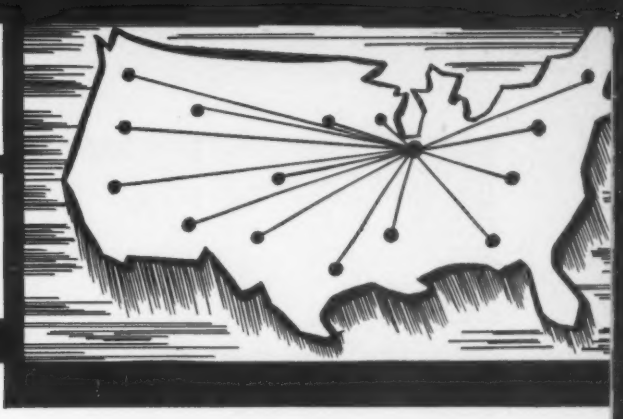
In passing, no article on chain would be complete without some reference to impact loadings and misapplications of the sling chain. To insure safety and a long and useful life of a sling chain, extreme care should be taken in preventing all unnecessary abuse in loading. From actual tests, it has been found that a chain will completely fail when subjected to two to four drops of three feet of only 30 per cent of its rated load, and approximately four to seven drops of two feet of the same weight. From these figures, one can readily understand the damage caused by impact abuse.

Iron and low carbon chains fail when 30 per cent of their safe load is dropped only 3 in. in thirty to seventy blows, and heat treated steels will only withstand 150 to 200 drops under the same conditions. Due to the hardness, and naturally reduced ductility, alloy steels fail at rather surprisingly low figures when tested for impact under similar conditions as above. Small drop impact loadings of large percentages of safe loading ratings of chain are frequently experienced by careless hook-ups, kinks, and indiscreet crane operation.

Precautions and Inspections

While every attention should be given to the operation of slings, and extreme care taken in inspection to check or anticipate any possible failures; nevertheless, an equal amount of attention should be given to the selection of the proper sling to protect the life of men whose duty it is to use this equipment in our industries. Safe load ratings supplied by manufacturers have been considered safe for many years, and approved by most of the leading technical societies. However, additional factors of safety should be considered where chains are continuously used day after day under such conditions where damage may occur which will cause their failure even between inspection periods.

Chapter Activities



(Continued from Page 14)

Culling Addresses Quad City Chapter

By J. Morgan Johnson*, Moline, Ill.

C. R. CULLING, vice president, Carondelet Foundry Co., St. Louis, was the guest speaker for the March 20 meeting of the Quad City Chapter, held at the Blackhawk Hotel, Davenport, Iowa. The chapter maintained its good attendance record with over 100 present. Horace Deane, Deere & Co., Moline, and vice chairman of the chapter, presided in the absence of chapter chairman M. J. Gregory of the Caterpillar Tractor Co.

Mr. Deane announced the appointment of a nominating committee to consist of a chairman, Fred W. Kirby, John Deere Spreader Works, and Gus Vergane, John Deere Harvester Works; E. C. Wussow, Williams-White & Co., and A. E. Hageboeck, Frank Foundries Corp. A coffee talk feature was given by Mr. Stephenson who presented an interesting summary of the history, advancement and future possibilities of the aviation industry.

Mr. Culling was then introduced and took as his subject, "General Foundry Practice in a Specialty Jobbing Foundry." He told of the wide variety of castings it was necessary to make in varying quantities with varied kinds of compositions. In a foundry of this type it is important to have an organization that can diagnose the situations that come up in the departments. Equipment is of importance for good operation, in the chemical and physical laboratory and melting department. Desirable sands for molding and facings to meet all needs are required as are good core ovens, and heat treat equipment. Mr. Culling told of the many points that come up in the making of the large variety of castings in regard to proper foundry practice. Sand control is of major consideration especially as it relates to testing and checking of facing and core sands. A second factor stressed was the gating and risering with the various types of feeds and why they are used. A third factor, considered most important, was the pouring of castings, as here could be found the causes for the larger per cent of poor castings if due consideration was not given to pouring temperatures.

All the information on the various practices was concluded by a series of excellent slides giving concrete examples of some of the work and equipment used for the jobs. Many vital and important questions came from members of the session with a discussion that was very valuable to the foundrymen.

*Tri-City Manufacturers' Association, and Secretary, Quad City Chapter.

Central New York Discusses Alloy Additions to the Cupola and Ladle

By L. D. Wright*, Geneva, N. Y.

THE second regular monthly meeting of the Central New York Chapter was held as a chapter dinner affair, March 10, at the Onondago Hotel, Syracuse. With chapter chairman Harold Judson, Goulds Pumps, Inc., presiding, there were some 75 members and guests present. Two new committees were announced as follows:

Program

Chairman, Frank C. Wheeler, Kimman & Wheeler, Syracuse, N. Y.
M. T. Ganzuage, Gould Pumps, Inc., Seneca, Falls.
Prof. A. C. Davis, Cornell University, Ithaca.
N. H. Boardman, Elmira Foundry, Elmira.
G. Fay, Fay Foundry, Syracuse.
H. Comstock, Syracuse Chilled Plow Co., Syracuse.
M. Hollenbeck, Kennedy Valve Mfg. Co., Elmira.

Membership and Reception

Chairman, B. Rathbun, Chemung Foundry Corp., Elmira.
F. F. Shortsleeve, Elmira.
W. Jones, International Heater Co., Utica.
W. Thomas, Straight Line Engine Co., Syracuse.
J. Sperry, Sperry Foundry Corp., Oneida.

After the business meeting John Ludwig of Electro Metallurgical Company gave a very interesting talk on "The Use of Briquets in the Cupola." He stated that the use of briquets for the addition of silicon, manganese, and chromium in cast iron melting is an important development in foundry practice. These briquets are easy to use and provide a practical and economical means for the addition of these elements to the cupola.

The use of ferro alloys in cast iron is recognized as perhaps one of the most important factors in foundry progress that have been made in the past twenty years. Plain gray cast iron consists essentially of a matrix of metal in which are interspersed flakes and part of the carbon in the combined form. The balance of the carbon is present as flakes of graphite. The physical property of the cast iron depends, therefore, on the character of the

*Supt., Geneva Plant, United States Radiator Corp., and Secretary, Central New York Chapter.

F. F. Shortsleeves G. M. Thrasher N. H. Boardman
Directors Central New York Chapter

matrix material and on the size and distribution of graphite flakes. The important function of alloying additions is, consequently, to control these two factors—the matrix and the graphite. This control is achieved by modifying the chemical composition of the matrix metal by influencing the structure of both the matrix and graphite and, in addition, by removing gases, oxides, and sulphides, or by nullifying their deleterious effects.

The briquets are held together by a binder which melts in a higher temperature than the ferro alloys, protecting them on the way to the melting zone so that there can be no absorption of gases or losses through oxidation. In the melting zone the ferro alloy melts from the briquet and dissolves immediately in the molten iron. The binder enters the slag and acts as a fluxing agent.

In discussing the additions of the graphite to the ladle, Mr. Ludwig explained that this was done to reduce the depth of chill and soften the iron in light sections. It also refines the graphite in both light and heavy sections.

In regard to ladle additions of ferro-manganese, ferro-silicon, and ferro-chromium, the speaker said, the manganese in both the briquet and crushed form is added for its well-known scavaging effect. Its benefits are most pronounced in deoxidizing and counteracting the prevailing high sulphur conditions where high scrap charges are used. Without sufficient manganese in such charges, sulphur increases stability of the carbon markedly, thus inhibiting graphitization and producing hardness.

The use of crushed ferro-silicon in the ladle has become commonplace due to the beneficial effects of late additions of silicon to the molten iron. The late silicon addition has a refining action on the graphite present and also forms a silicon matrix that is somewhat harder and increases the strength of the resulting iron. Chromium has taken its place along with silicon and manganese in the foundry melting practice. In some shops the chromium is added where heat resistance is required in the metal as cast. For this application it was found that 1 per cent chromium and 2 to 2.6 per cent silicon iron gave the best all-around results. Other uses of chromium addition are for the production of high-test and long-wearing performance under abrasive conditions.

The speaker's statements on this subject created a great deal of discussion and, following the meeting, the members had a general discussion among themselves as to the practical benefits they were deriving from the ferro alloy additions in their respective shops.

Modern Developments in Cast Iron Viewed by Metropolitan Philadelphia Chapter

By J. T. Fegley*, Philadelphia, Pa.

SOME 135 members of the Metropolitan Philadelphia Chapter met on March 10 at the Engineers Club for their regular meeting of the month. Chapter Chairman Harold Henszey presided. H. R. Salisbury, Air Reduction Sales Co., Philadelphia, gave an interesting coffee talk on "Liquid Air." He was introduced by Lee Harris, Link-Belt Co., a director of the chapter. The meeting was then turned over to the technical chairman of the evening, John H. Spencer, H. W. Butterworth & Sons., who introduced H. W. Kelly, foundry engineer, Meehanite Metal Co., Chicago, who spoke on "Modern Developments in Cast Iron."

Mr. Kelly's talk was in two parts, the first part dealing with twelve methods of charging cupolas illustrated with lantern slides and graphs showing the man hours and costs of charging ten tons to fifty tons for the twelve methods, in a 48-inch cupola. Part two of this talk dealt with the new improvements in cleaning equipment and was also illustrated with slides and plant layout drawings.

Pictures of the several mechanical methods of charging cupola were shown with the man hours and cost per ton included in the picture. Mention was made of the new insulated pouring ladles with a description of their efficiency compared to the open ladle. This was also illustrated with slides of the several types of ladles, also slides showing costs and comparisons for the ordinary tumbling mills, sand blast rooms, tum-blast wheelabrator, hydro-blast system and mention was made of the

*North Brothers Mfg. Co., and Chairman, Publicity Committee, Metropolitan-Philadelphia Chapter.

hydro-blast tumbling mill not yet on the market.

Grinding machines, wheels and their efficiency was illustrated and the difference in costs of hard and soft wheels, the efficiency of the high speed wheel compared to slow speed wheels still found in use in many foundries. Metal removal rates per minute for wheels were discussed. Cleaning room layouts were shown on the screen and compared with more modern layouts showing the reduction in costs for the proper design of cleaning rooms compared with the inefficient cleaning room.

Much interest was created in the mention of the short wave electric drying system invented by John Stephens of Chicago. This method is being used at present in the drying of lumber and has cut down the drying of lumber from weeks to hours and is under very accurate control. The speaker brought out the possibility of drying cores with this same method with a great reduction in costs and time required compared with present day core drying methods. Shake-out and mulling machines were mentioned, and several of the newer machines that have made great strides in the reduction of costs and the faster handling of castings. All illustrations and costs were actual figures taken from plants using the equipment described and were taken from surveys made of many plants in all parts of the country.

Questions were asked after the meeting as to how much money was required to use equipment of this nature. The speaker made an effort to portray to the audience that it was not his intention to lead them to believe that expensive equipment is the most economical in all operations, but tried to show that unless tonnages were sufficient to warrant the purchase of expensive equipment it was foolish to make investments that would not return a good rate on the savings in time or handling.

Ontario Chapter Learns About Refractories

By G. L. White,* Toronto, Ont.

SPEAKING on refractories at the February meeting of the Ontario Chapter in Toronto, C. E. Bales, Vice-President, Ironton Fire Brick Company, Ironton, Ohio, outlined methods of manufacture and application in cupolas, ladles and malleable iron furnaces. An excellent series of slides illustrated the lecture from the mining of the clay to the pouring of metal from the lined ladle.

In the manufacture of cupola blocks, machine methods have largely replaced hand production; the harder, denser, machine-made blocks withstanding most of the conditions encountered in the cupola better than the hand-made material. In modern machine production the mixed materials, clay, calcined clay, etc., wetted just enough to make them plastic, are extruded from a die under pressure. The blocks cut to size from the column of mud are re-pressed under high pressure, dried in tunnel driers by waste heat from kilns, and fired in kilns holding about seven carloads of brick at a charge. A dry pressed brick, made with very little addition of water to the mix is applicable where a more open brick is required. Hand production is still employed in the manufacture of special shapes which are not produced in sufficient numbers to warrant the development of specific machinery for the purpose.

The cupola may be divided into four zones, in respect to its lining requirements. (1) The zone above the charging door is not subjected to severe conditions and the lining need only be of a quality that will protect the metal shell from hot gases. (2) The zone between the charging door and the top of the melting zone is subject to severe abrasion by the downcoming charge. High temperature only exists near the melting zone where the lining must not only withstand the abrasion and high temperature, but also the action of particles of slag and molten metal blown against it by the blast. (3) The lining of the melting zone must withstand intense heat, the action of the molten metal, slag and fluxes; the cutting action of the blast; and the breakage due to chipping in the patching operation. (4) The crucible lining must resist the corrosive action of molten metal, possibly highly oxidized, and spall resistance may be necessary if sudden temperature changes occur.

Dense, hard, machine-made cupola blocks give good resistance to abrasion and to the action of molten iron and slag. The thinnest possible joints should be used to reduce attack at these points to a minimum. Patching of the cupola should be done with good daubing material, made with fireclay and white silica sand, or fire clay and crushed firebrick.

In tea-pot ladles refining agents such as fused soda ash have made many types of lining practically worthless. Soda slag is extremely detrimental to brick work and to mud linings with high silica content. Plastic refractories made from highly calcined, crushed fire brick with a minimum of refractory bonding material have proven very useful in this service. These rammed linings should be at least five inches thick.

Useful developments in refractories for the foundry include refractory cements for laying up the lining in the melting and crucible zones of the cupola eventually making a monolithic lining; ladle pouring brick designed to allow bottom pouring of molten metal from the ladle; and ladle bottom tiles. These last bricks are discs of various diameters for different sized ladles, made of high quality refractory materials. They eliminate boiling in ladles which is experienced when moisture is not thoroughly driven off in drying mud bottoms.

*Canadian Metals and Metallurgical Industries and official reporter, Ontario Chapter.

April Chapter Meetings

April 3

Buffalo
Hotel Touraine
MARSHALL POST—*"Cement Molding"*

April 10

Chicago
Medinah Club
DR. R. J. GREENLY—*"Human Engineering"*

April 11

Cincinnati District
Hotel Alms
C. O. MORKEN—*"Production of High Test Iron"*

✦

Northern Illinois-Southern Wisconsin
Freeport, Ill.
B. P. MULCAHY—*"Foundry Coke—A Raw Material and Fuel"*

April 13

Northeastern Ohio
Cleveland Athletic Club
"Alloy Cast Iron"

✦

St. Louis
Hotel York
DR. A. B. KINZEL

April 14

Central New York
Hotel Onondago, Syracuse
ROBERT WATSON—*"Coke and Modern Cupola Practice"*

April 14 and 15

Detroit
Michigan State College, East Lansing, Michigan
Regional Conference — *"Castability"*

April 17

Quad City
LeClaire Hotel, Moline
C. O. THIEME—*"Non-Ferrous Castings"*

✦

Metropolitan New York-New Jersey
Essex House, Newark, N. J.
Joint Meeting With Newark Chapter, A.S.M.
R. A. GEZELICES—*"Steel Castings"*

April 21

Birmingham
Hotel Tutwiler
U. S. STEEL CORP. TECHNICOLOR FILM—*"Steel, Man's Servant"*

✦

Kansas City, Mo.
President Hotel
Meeting Sponsored by St. Louis Chapter
C. R. CULLING—*"General Foundry Practice in a Specialty Jobbing Foundry"*

Metropolitan Philadelphia
Engineers Club
National President's Night—MARSHALL POST
DR. MICHAEL M. DORIZAS—*"The European Situation"*

✦

Wisconsin
Hotel Schroeder, Milwaukee
SENATOR E. R. BURKE, NEBRASKA — *"Why We Must Amend the Wagner Act"*

April 22

Northern and Southern California
Joint Meeting
Fresno Hotel, Fresno
A. PAUL—*"Observations of Industrial Trends"*

April 25

Michiana
Hotel Oliver, South Bend, Ind.
L. P. ROBINSON—*"Some Core Room Problems"*

April 28

Ontario
R. G. MCELWEE—*"Modern Trends in Cast Iron Melting"*

Chicago Chapter Holds Equipment Meeting and Ladies Night Party

ONE of the most interesting and instructive meetings of the Chicago Chapter was held March 13 at which time seventeen five-minute talks were presented by representatives of various manufacturers of foundry equipment. An attendance of some 200 members and guests was present when the meeting was called to order by Chapter Chairman L. H. Rudesill, Griffin Wheel Co. Mr. Rudesill introduced James Thomson, a past Chapter Chairman, as master of ceremonies, and Mr. Thomson, aided by a warning bell arrangement, directed the meeting with great skill and dispatch. He announced that a time limitation of five minutes would be imposed on each speaker, they to cover their subjects as they saw fit, and the results were voted by all present as presenting a splendid picture of special equipment developments. The talks were divided into four groups, molding machines, sand, melting and cleaning equipment.

Molding machine developments were presented by W. W. Hughes, Herman Pneumatic Machine Co.; R. F. Lincoln, Osborn Mfg. Co., Cleveland, and L. D. Pridmore, International Molding Machine Co.

Sand control equipment developments were discussed by A. G. J. Rapp, Clearfield Foundry & Machine Co.; R. C. Johnson, Simplicity Engineering Co., Durant, Mich.; W. L. Hartley, Link-Belt Co.; H. L. McKinnon, C. O. Bartlett & Snow Co., Cleveland, and C. D. Hollins, Royer Foundry & Machine Co.

Under melting equipment, H. J. Payne, Pittsburgh Lectromelt Furnace Co., discussed the top charge electric furnace; H. W. Dietert, Harry W. Dietert Co., presented a thermocouple for measuring molten iron temperature; R. S. Hammond, Whiting Corp., discussed cupola charging equipment, and A. E. Rhoads, Detroit Electric Furnace Div., Kuhlman Electric Co., Bay City, Mich., talked on the rocking direct arc electric furnace.

Under the heading of cleaning equipment, E. B. Rich, Jr., American Foundry Equipment Co., gave a talk on the wheelabrator development; A. L. Gardner, Pangborn Corp., Hagerstown, Md., discussed the vaneless rotoblast cleaning wheel; J. C. Pierce, Hydro-Blast Corp., gave data on high pressure water blast cleaning; A. B. Eastwood, Tabor Mfg. Co., presented a discussion of abrasive cutting, and W. G. Frank, American Air Filter Co., discussed roto-clone exhaust equipment.

Ladies' Night

The largest and best social gathering of the Chicago Chapter was the Ladies' Night party held the evening of March 17 at the Medinah Club. Some 800 members, their ladies and guests participated in an evening of re-

ception, dinner, floor show and dancing, and a thoroughly enjoyable time was had by all, after they had been welcomed by Chapter Chairman Rudesill.

That the events moved so smoothly was due to the splendid direction of the entertainment committee under the chairmanship of John Abbott, Hickman, Williams & Co., and the Ladies' Night committee with J. C. Gore, Werner G. Smith Co., as chairman, and P. V. Martin, Carnegie-Illinois Steel Co., as secretary. These men were ably assisted by the members of the Ladies' Night committee composed as follows: B. J. Aamodt, National Malleable & Steel Casting Co.; Wm. E. Brewster, Wisconsin Steel Co.; H. E. Cullen, Carnegie-Illinois Steel Corp.; H. A. Forsberg, Continental Roll & Steel Foundry Co.; D. M. Gellert, Nichol-Straight Foundry Co.; A. W. Gregg, Whiting Corp.; Harold Henninger, International Harvester Co.; Wm. Hitchins, The Pyle-National Co.; H. B. Hoge, Western Foundry Co.; H. W. Johnson, Northwestern Foundry Co.; Ed Longenbach, American Manganese Steel Co.; H. W. Maack, Crane Co.; T. J. Magnuson, J. S. McCormick Co.; O. C. Olson, The S. Obermayer Co.; Harry Orr, Burnside Steel Foundry Co.; W. C. Packard, National Engineering Co.; John Owen, Harbison-Walker Refractories Co.; W. A. Parker, American Steel Foundries; H. J. Pfeifer, Electro-Metallurgical Sales Co.; H. J. Sprecken, Jr., International Harvester Co.

Northeastern Ohio Learns About Pattern Equipment and Aluminum Production

OVER 120 members and guests attended the regular meeting of the Northeastern Ohio chapter of the A.F.A. held March 9 at Guildhall, Cleveland. Two coffee talks and the principal address of the evening were presented by members of the group. In the first coffee talk, J. S. Parker, Motor Patterns, Inc., Cleveland, discussed various problems connected with patterns. He pointed out the vast difference between patterns 30 years ago and today and stated that since pattern lumber only amounts to 10 per cent of the total cost it never pays to use cheap lumber. In his opinion a skilled pattern maker always endeavors to make a pattern which can be molded easily and which will retain its shape indefinitely. Mr. Parker concluded by citing examples where modern pattern equipment increased production and lowered costs.

J. A. Balazs ,Hines Flask Co., Cleveland, spoke briefly on flask equipment for the foundry. He stated the use of wood flasks is a handicap to the foundry, due to the tendency to absorb water, spring out of shape and burn. In his opinion aluminum flasks eliminate these factors and enable the molder to do a better job. Mr. Balazs believed about 80 per cent of all light and medium castings can be made in slip flasks. In closing his talk he mentioned several examples where proper flask equipment cut losses and increased production.

The final feature of the meeting was an extremely interesting two-reel sound motion picture on production of aluminum and some of its applications, presented by H. J. Rowe, Aluminum Co. of America, Cleveland. Mr. Rowe stated that while considerable aluminum was being produced and used it amounts only to slightly over 1 per cent of the total of all metals. According to available figures 94 per cent of metals produced is iron and its various forms and the remaining 6 per cent includes copper, zinc, lead, aluminum, etc. Of the latter, aluminum production is about 18 per cent. Mr. Rowe also pointed out that 33 per cent of aluminum used is employed in the transportation field such as aircraft, railroads, etc.; 16 per cent is used for cooking utensils; 12 per cent for electrical conductors; 11 per cent for machinery and electrical appliances; 6 per cent in building applications, and 6 per cent in the chemical industry.

Deane Talks on Sand Control Before No. Illinois-So. Wisconsin Chapter

THE evening of Tuesday, March 14th, the regular monthly meeting of the Northern Illinois-Southern Wisconsin Chapter was held at the Hotel Faust, Rockford, Ill. With a large number of members from the other cities of the chapter territory present, chapter chairman John Clausen, Greenlee Bros. Co., Rockford, opened the evening's meeting by announcing the appointment of a committee to handle the chapter's annual picnic in June. After the reading of the minutes of the last meeting. by Geo. Minert, chapter secretary, chairman Clausen introduced the speaker of the evening, Horace Deane, metallurgist, John Deere & Co., Moline. Mr. Deane extended the greetings of the Quad City Chapter of which he is vice chairman. Following this he gave an exceedingly interesting talk on practical considerations of foundry sand control. In his discussion he reviewed the properties and applications of both natural and synthetic molding sands, and went into detail concerning the practices needed in controlling heaps and systems in various types of foundries. A very interesting period of questions and answers followed the general presentation.

Significant Trends in the Foundry Industry Discussed at Ontario Meeting

By G. L. White,* Toronto, Ont.

THE regular monthly meeting of the Ontario chapter for March was held at the Rock Garden Lodge, Hamilton, on the 17th, with chairman Joseph Sully, Sully Brass Foundry, Ltd., presiding, and about ninety-five in attendance. The speaker on this occasion was F. J. Walls, International Nickel Company, Detroit. His broad contacts with the foundry industry have given him an excellent opportunity to observe significant trends and he interpreted these in an instructive and interesting review. He stated that the cupola still remains as the heart of the foundry and as the phase of foundry operation about which the least is known. Some of the trends in cupola design are illustrated by the development of the balanced blast cupola, a bottom tap cupola in which the ladle is directly underneath, and a cupola with two rows of tuyeres. Improvements in blowers and in metering devices have contributed to better operation of the blast, with pre-heaters and control of moisture in the blast subject to increasing attention. The importance of slags and of their effect upon the properties of the iron is now coming to the fore.

The pressure gauge is of the utmost importance in telling what is going on within the cupola, and developments in recording pyrometers, usable in the molten metal, appear very promising, although this type of temperature measurement has not been too successful in the past. In the future water-cooling may permit the operation of cupolas with very little refractory material, water-cooling of segments just above the tuyeres having already proved quite satisfactory in some installations.

In recent years important advances have been made in the treatment and handling of molten metal in the brief period between tapping from the cupola and pouring into the mold. The use of mixing ladles has eliminated many variables from molten metal and has provided an excellent opportunity for purifying treatments or the addition of alloying materials. In the production foundry a monorail scale to hold the ladle enables the operator to pour to the ladle just that amount of metal that is required for the casting, thus doing away with much pig iron which is costly in the foundry because no adequate provision is made for handling it.

Other trends reviewed were the use of permanent molds and castings with special properties for particular engineering applications.

* Canadian Metals and Metallurgical Industries and reporter for Ontario Chapter.

Wisconsin Chapter to Hear Senator Burke at Milwaukee Dinner Meeting

By B. D. Claffey,* Milwaukee

THE Wisconsin Chapter is planning as its outstanding meeting of the year that to be held April 21 at the Schroeder Hotel, Milwaukee. The guest speaker will be Honorable E. R. Burke, United States senator from Nebraska, who will present an address, "Why We Must Amend the Wagner Act." It is planned to have at this dinner Governor Heil of Wisconsin and several other noted industrialists of the state. Organizations invited to cooperate in this dinner meeting are Industrial Relations Association of Wisconsin and the Employers Association of Milwaukee. It is expected that six or seven hundred members and guests will participate.

The March meeting of the Wisconsin chapter was held on the 17th with chapter chairman Roy M. Jacobs, Standard Brass Works, presiding. E. D. Meyer, Chain Belt Co., reporting as chairman of the nominating committee, announced the following as nominees for election at a later meeting:

To serve one year:

President—W. J. MacNeill, Federal Malleable Co.

Vice-President—B. D. Claffey, General Malleable Corp.

Secretary—A. C. Ziebell Universal Foundry Co.

Treasurer—Milton Carpenter, Carpenter Bros.

Directors to serve three years:

R. S. MacPherran, Allis-Chalmers Mfg. Co.

Edw. Ward, Badger Malleable Co.

Director to serve one year:

E. L. Roth, Motor Casting Co.

The speaker of the evening meeting was Bob Woodward, Bucyrus-Erie Co., South Milwaukee, who discussed "The Metallurgy of Heavy Machinery Castings." A coffee talk feature was given by radio commentator and news analysist, Phil Grau.

* General Malleable Corp. and Secretary, Wisconsin Chapter.

Castings and Cores displayed by M. J. Gregory, Caterpillar Tractor Company, in connection with his address before Wisconsin Regional Foundry Conference.

Abstracts

Note: **The following references to articles dealing with the many phases of the foundry industry, have been prepared by the staff of *American Foundryman*, from current technical and trade publications.**

When copies of the complete articles are desired, the Association will be pleased to furnish the address of the publication, or photostat copies may be obtained by ordering through Engineering Societies Library, 29 W. 39th Street, New York, N. Y.

Cast Iron

ALLOY. *"Alloy Cast Iron,"* H. A. MacColl, *Foundry Trade Journal,* vol. 60, no. 1176, March 2, 1939, pp. 189-190. The author describes the production of alloy cast iron and its constituents. Pearlite, ferrite, phosphide entectic and cementite are described in detail. Also the effect of special elements on the structure of austenite, martinsite, troostite and sorbite are detailed. A bibliography is included. (C.I.)

ALLOY. *"Alloy Cast Iron,"* T. Shanks, *Foundry Trade Journal,* vol. 60, no. 1171, Jan. 26, 1939, pp. 102, 104. Cast Irons contain a number of more or less naturally attached elements. These are carbon, silicon, manganese, sulphur and phosphorus. It is these elements which make iron castable. Each of the elements and the various forms they are found in are taken and described individually. (C.I.)

COPPER. *"Copper in Gray Cast Iron,"* F. E. Fisher, *Pig Iron Rough Notes,* Winter 1939, pp. 15-19. This is the first of a series of articles on this subject. The author states that copper in the past five years has become an important alloy in gray iron and such advances have been made since 1935 that copper gives promise of becoming one of the most generally used alloys within the next few years. Tables showing the effects of copper on graphitization and graphitizing value of alloys are included. Methods of adding copper and its effects on various physical properties are described. (C.I.)

CUPOLA. *"Investigation of Some Relationships Between Variables of the Cupola,"* M. M. Barigozzi, *Foundry Trade Journal,* vol. 60, no. 1175, Feb. 23, 1939, pp. 171-172, 186. Italian exchange paper presented before Polish International Foundry Congress. Data collected from questionnaire sent to 100 cupola operators in Italy. The information requested was on cupola operations and construction from which the author tried to correlate the variables in order to determine the relationship. (C.I.)

ELASTICITY. *"Elasticity of Cast Iron Determined," The Iron Age,* vol. 143, no. 11, March 16, 1939, p. 35. An optical method for measuring the deflection of cast iron transverse test bars up to the breaking strength has been developed by A. I. Krynitsky and C. M. Saeger, Jr., of the Department of Commerce and this article tells briefly of the procedure of the method. (C.I.)

HIGH DUTY. *"Some Notes on High Duty Cast Iron,"* J. H. Williams, *Foundry Trade Journal,* vol. 60, no. 1175, Feb. 23, 1939, pp. 176-178. The author describes various processes of producing high duty cast iron. Cupola practice and alloys are also discussed. Discussion which followed presentation of paper is included. (C.I.)

MIXING FOREHEARTHS. *"Forehearths," Canadian Metals and Metallurgical Industries,* vol. 2, no. 2, Feb. 1939, pp. 30, 31, 38. This article is based upon papers presented before the Ontario Chapter of A.F.A. J. Thwaites presented forehearths proper and H. Davis dealt with the teapot ladle. The advantage of these methods of holding iron are: (1) Better mixing of the metal. (2) The provision of sufficient time for the iron to get rid of entrapped impurities. (3) A closer approach to continuous pouring is achieved, resulting in hotter metal. (4) There is an opportunity to chemically treat the metal for elimination of sulphur and oxides. (5) The removal of sulphur and oxides leads to better machinability. (6) The good refining program that can be carried out in the ladle allows for an increase in scrape additions. These may be as high as 80 to 90 per cent. The advantages and disadvantages of each process is discussed. (C.I.)

PHOSPHOROUS. *"Phosphorous in Pig and Cast Iron,"* J. G. Pearce, *Pig Iron Rough Notes,* Winter 1939, pp. 5-7. The author describes the difference in outlook between the U.S.A. and Great Britain on phosphorous in pig iron and cast iron. The phosphorous content of various types of pig and cast iron are described. This article will be continued in a following issue.

PRODUCTION. *"Gray Iron Metallurgical Practice,"* C. H. Lorig, *The Foundry,* vol. 67, no. 3, March 1939, pp. 26, 27, 76, 78. This is the first of two articles from a paper presented by the author at a recent meeting of the Chicago Chapter of A.F.A. The author describes high strength iron and states that metallurgical control should make possible the purchasing of pig iron, coke, sand and other foundry raw materials from reputable producers close at hand. Also that best results are not obtained with either cheap or expensive materials unless knowledge of how to use them is available. Curves showing various physical properties at different temperatures are included. (C.I.)

SILICON CARBIDE. *"Silicon Carbide Additions to Cast Iron,"* J. A. Boyer, *Metals and Alloys,* vol. 10, no. 2, Feb. 1939, pp. 59-63. Second part of article, first part was published in January. The author continues his discussion on the use of silicon carbide with the use of very clear and illustrative micrographys. Also he states that silicon carbide is not a "cure-all" for cast iron. However as the tests have involved considerably more than 100,000 tons of cast iron and have shown that a hard, close-grained machinable iron can be obtained from a comparatively low-grade charge through the addition of silicon carbide. (C.I.)

Castings

DIESEL ENGINES. *"Casts Diesel Engines for Trucks,"* P. Dwyer, *The Foundry,* vol. 67, no. 3, March 1939, pp. 22-25, 72, 75. The author describes the manufacture of castings for diesel engines as produced in the foundries of one of the leading truck manufacturers. Photographs are given illustrating various operations in the production of these castings. The cycle of operation is described from scrap in the year to the finished castings of aluminum, bronze, brass and gray iron. (C.)

PRODUCTION. *"Production of Castings from Shell Patterns,"* J. Cameron, *Foundry Trade Journal,* vol. 60, no. 1175, Feb. 23, 1939, pp. 179-182. The author describes the production of castings from patterns which leave their own cores or patterns which do not incorporate the use of cores made from a separate core box. Sand, molding boxes, temporary patterns and cast iron bars are discussed in detail. Special drain castings, long flanged bends, man hole bottoms and other castings are described. Numerous photographs are given illustrating various castings and patterns. (C.)

SOUNDNESS. *"Porosity, Sponginess, etc., in Castings,"* R. H. Smith, *Pig Iron Rough Notes,* Winter 1939, pp. 22-30. Various causes of porosity are described. The author states the reason one hears so much about shrinks and other foundry defects is that the emphasis is on strength, impact and other physicals and thereby losing sight of the prime requisite of a casting which is soundness. A systematic course of investigation for studying defects is described. (C.)

Design

DIE-CASTING. *"Designing for Die-Casting,"* A. Street, *The Metal Industry* (London), vol. 54, no. 4, Jan. 27, 1939, pp. 131-134. This article is the first part of a paper by Dr. Street dealing with the practical designing aspect of the die casting process. The modification of existing designs so as to meet the needs and limitations of the process is often necessary in order to obtain the maximum value from die casting and this simplification of design will usually result in an immediate reduction in the cost of the article and so bring about increased life and serviceability of the die. (D.)

STEEL CASTING. *"How Welding Can Help in Redesign of Steel Castings,"* J. A. Shuffstall, *Machine Design,* vol. 11, no. 12, Feb. 1939, pp. 41-43. The author describes how welding and steel casting should go hand in hand. A number of examples of welding and casting combinations are given and various diagrams illustrating how this can be done is also produced.

Furnaces

HEAT TREATING. *"Implement Parts,"* J. P. Wilson, *Steel,* vol. 104, no. 6, Feb. 6, 1939, pp. 50, 51, 57. New compact, automatic installation consisting of hardening furnace, oil quench and air drawing furnace effects economies in heat treatment of a wide range of specialized parts for farm and garden tools. (F.)

Heat Treatment

BRAZING. *"Factors Affecting Selection of Furnace-Brazing Equipment,"* H. M. Weber, *The Iron Age,* vol. 143, no. 11, March 16, 1939, pp. 30-35. Why, where and how to use electric-furnace brazing has been covered by the author in previous articles in this series. In this article, the tenth, he describes the various types of furnaces and discusses the influence of production rate, size of assemblies, cost of operation and maintenance and other factors in meeting individual requirements. Various photographs are given illustrating different furnaces and the principles applied. (H.)

HARDENING. *"Tool Hardening,"* W. W. Young, *Industrial Gas,* vol. 17, no. 9, March 1939, pp. 8-10. In answer to the questions "Why should a small company do it's own hardening?" The author states his belief that installing small atmospheric gas-fired furnaces enables the manufacturer to achieve under his own supervision almost any desired heat treatment of tool or small parts with convenience and saving of cost and time. (H.)

Iron Castings

PROBLEMS. *"Some Jobbing Problems,"* F. G. Jackson, *Foundry Trade Journal,* vol. 60, no. 1177, March 9, 1939, pp. 212-214. This paper which was presented before the Wales and Monmouth Branch of the Institute of British Foundrymen will be continued in the following issue. The various jobbing castings described are hydraulic cylinders and rams, hydraulic brake cylinders, rotary and screw pumps and small rolls. Photographs are included showing various castings in production or illustrating various points described. Very practical article. (C.)

Malleable

GALVANIZING. *"Hot Galvanizing Malleable Iron," The Iron Age,* vol. 143, no. 11, March 16, 1939, p. 44. This article describes the use of fluxing solutions in the hot galvanizing of malleable iron. A photograph is given showing the results of using two different fluxing solutions. (M.)

Material Handling

BLOWERS. *"Selection of Cupola Blowing Equipment,"* S. D. Moxley and W. T. Barr, *Foundry Trade Journal,* vol. 60, no. 1174, Feb. 16, 1939, pp. 156-158. This paper was presented before 1938 joint meeting of A.F.A. and A.S.M.E., Birmingham Chapters, at Birmingham, Ala. The author describes the engineering, maintenance and economic factors which are important in the selection of cupola blowing equipment, once the engineer is furnished with the metallurgical and operating requirements prevailing in the shop. Types of blowers, characteristics, space requirements, control, noise and vibration, flexibility, maintenance, installation cost and power are the subject discussed in detail. A practical article. (M.H.)

Molding

LOAM. *"Examples of Loam Molding,"* R. D. Lowrie, *Foundry Trade Journal,* vol. 60, no. 1172, Feb. 2, 1939, pp. 115-117, no. 1173, Feb. 9, 1939, pp. 139-140. The use of loam has many advantages in the foundry, more particularly in the jobbing foundry. By its use the cost of pattern-making can in many instances be considerably reduced and although it cannot be employed profitably in every case, there are certain classes of work for which it is eminently suited. The author describes a number of instances where it has been used and gives a number of illustrations to illustrate various points as they are brought out. In the second and concluding part of this article the author describes the molding and casting of an exhaust steam bend by this method. Various photographs showing different steps in the construction of the mold are given. (Mo.)

MACHINE. *"Some Notes on Machine-Molding,"* B. Gale, *Foundry Trade Journal,* vol. 60, no. 1171, Jan. 26, 1939, pp. 93-96. The author describes various machines used in molding operations and what types of castings should be made on each. Also a photograph of each type is given. The advantages one type of machine has over another are numerated and compared with flask and floor molding. (Mo.)

Non-Ferrous

ALLOYS. *"Non-Ferrous Foundry Has Wide Range of Alloys Available,"* N. K. B. Patch, *The Foundry,* vol. 67, no. 3, March 1939, pp. 30, 84, 86. This is the third article of the series. Articles one and two appeared in the January and February issues of the FOUNDRY. The author continues his listing of these non-ferrous alloys and describes various advantages and disadvantages. Data on the physical properties, pouring and melting temperature and chemical analysis are included. (N.F.)

ALUMINUM. *"Improvements in the Art of Casting Aluminum Alloys,"* H. J. Rowe, *Metal Progress,* vol. 35, no. 3, March 1939, pp. 249-253, 290. It is emphasized that various coordinated investigations into alloy composition, foundry technique, heat treatment, inspection methods and finishing operations have so improved aluminum castings that many new and successful applications have been found in the transportation, electrical, architectural, food, and machine tool industries. Photographs are included illustrating casting of varying design, shape, size and section thickness. (N.F.)

ALUMINUM-BRONZE. *"Non-Ferrous Foundry Practice—XVII Aluminum Bronze,"* J. Laing and R. T. Rolfe, *The Metal Industry,* vol. 54, no. 3, Jan. 20, 1939, pp. 107-110. The copper aluminum alloy is discussed for corrosion resistance, casting difficulties, mechanical properties, heat treatment, and effect of heat treatment on physical properties. Data is given for varying percentage of aluminum for both sand castings and chill castings. Curves and micrographs illustrate various points. A bibliography is also given. (N.F.)

BRONZE. *"Cast Bronze Bell in Mexico,"* H. H. Miller, *The Foundry,* vol. 67, no. 2, Feb. 1939, pp. 30, 31, 82. The author describes various bells of former years and how they were made. Also various photographs are given illustrating various kinds of bells found in Mexico.

DEFECT CAUSES. *"Defects in Non-Ferrous Ingots,"* G. L. Bailey, *The Metal Industry* (London), vol. 54, no. 8, Feb. 24, 1939, pp. 239-242. A paper recently presented before the Midland Metallurgical Societies. The author discusses the cause and prevention of casting defects. Various defects such as oxide patches, laps and splashes, blowing and molding defects, inverse segregation, evolved gases, entrapped gases and shrinkage are discussed. Micrographs are included to illustrate certain important points.

DURALUMIN. *"The Manufacture of Duralumin,"* G. Sachs, *The Metal Industry* (London), vol. 54, no. 9, March 3, 1939, pp. 263-266. This paper is in two articles. In the first of these articles the author deals with problems generally encountered in the manufacture of Duralimin and also outlines some recent developments in equipment and materials which contributed to the solution of many of these problems. The author traces the original material through all its processes of manufacture and discusses the difficulties met with at each stage. (N.F.)

MANGANESE BRONZE. *"Gas Dries Floor Molds,"* O. E. Barene, *Industrial Gas,* vol. 17, no. 9, March 1939, pp. 14, 16. Gas fired air heater used in drying molds for large propellers of manganese bronze was experimented with. A good heat penetration was obtained in a 24 hour period. The saving by using this method over the old amounted to $52 per mold. (N.F.)

Pattern Making

METAL. *"Precision-Production of Metal Patterns and Core Boxes," Foundry Trade Journal,* vol. 60, no. 1173, Feb. 9, 1939, p. 133. This article describes the operation and use for production methods the three-spindle Keller Automatic Tootroom Machine. Two photographs showing the machine in action are included. (P.)

Production

CONTROL. *"Shop Control Methods Cut Production Losses,"* C. Zust, *The Foundry,* vol. 67, no. 2, Feb. 1939, pp, 22, 23, 66, 71. The small jobbing as well as the large production foundry has to meet problems in the control of production that may mean losses or profits in operating. The haphazard way of producing castings according to the formula of "making anything at any time" gradually is becoming obsolete. The author describes a number of systems and ways in which the small as well as the large foundries can improve their production methods. Various illustrations of the cards and files used in the system are given. (C.)

Refractories

FURNACE. *"Furnace Insulation,"* G. E. Grimshaw, *"Industrial Gas,* vol. 17, no. 8, Feb. 1939, pp. 11-16. This paper treats with the application of insulations to industrial furnaces operating at temperatures vary from 400 to 2000° F. and using fuel consisting of manufactured or natural gas. The general problems of insulating industrial furnaces as applied to new and old or existing furnaces is described in detail. Various types of insulations are tested and their advantages and disadvantages given.

This paper may be applied to such furnaces as tempering, malleableizing, stress relieving, normalizing, annealing, carburizing, hardening, etc. (R.)

SILILCA BRICK. *"Spalling of Silica Brick During Heating and Cooling of Furnaces,"* J. M. McKinley and S. M. Phelps, *American Ceramic Society,* vol. 22, no. 3, March 1939, pp. 83-90. A study of the spalling of silica brick in service has shown that a cobblestone shape of fracture usually occurs. Inasmuch as this fracture was not secured in laboratory tests a study was made of the influence of the various heating and cooling treatments to bring about this fracture. Several procedures which gave this result are recorded. Various photographs showing spalling of brick in furnaces are also included. (R.)

Sand

CONTROL. *"Sand Control for Better Castings,"* H. W. Dietert, *Metals and Alloys,* vol. 10, no. 3, March 1939, pp. 90-95. This article based on a paper presented before a regional meeting of A.F.A. discusses in practical fashion just how the type of sand affects quality of various metals, and what simple methods are available today for testing, controlling and standardizing the grades and quality of foundry sands used. Photographs are given illustrating various defects of the machine or machines which should be used to overcome the difficulties. A very practical article. (Sa.)

MOLDING. *"Effect of Moisture on the Principal Properties of Molding Sands,"* J. Dearden, *Foundry Trade Journal,* vol. 60, no. 1173, Feb. 9, 1939, pp. 141-144. This paper is chiefly confined to the effect of moisture on sand especially from a molding point of view. The views and data here given are the results of the authors experimentation. From various English sands tested the author arrived at these conclusions. (1) That each sand of view within the range of moisture increasing moisture gives a reduced permeability and green strength, but a much higher dried strength; it also makes the sand easier to ram, in which case there is danger of the permeability being reduced even lower. (3) Red sands are affected by moisture to a lesser extent than other and more heavily bonded sands. (4) The maximum green strength of raw molding sands is developed at a lower moisture content than is required for facing sands which contain both used and unused coal dust. The discussion following the presentation of this paper is also included with the diagrams of the various tests. (Sa.)

Refactories

FURNACE. *"Refractories for the Iron Foundry," Canadian Metals and Metallurgical Industries,* vol. 2, no. 3, March, 1939, pp. 64-65. Abstract of a paper presented before the Ontario Chapter, A.F.A., by C. E. Bales. The use of bricks and blocks in the linings of cupolas, malleable iron furnaces and teapot ladles is described. Special refractory products for uses such as pouring ladles, cupola, etc., are also described. Mixes which have proven successful for patching are: (1) 1 part plastic fire-clay (minimum fusion point cone 26), 2 parts white silica sand (waste sand from the sand blast machine is excellent, provided it does not contain too much scale). (2) 4 parts plastic fire-clay (minimum fusion point cone 26), 6 parts crushed fire-brick (old fire brick from the cupola lining can be crushed to necessary 10 mesh by placing in a tumbler barrel with a few pigs or iron). (R.)

Steel

HARDENABILITY. *"Estimation of Hardenability of Steel from Its Analysis and Grain Size,"* R. S. Archer, *Metal Progress,* vol. 35, no. 3, March 1939, pp. 257-263. The author shows how it is now possible to predict the hardenability of a heat of carbon steel, while it is yet in ingot form, from its chemical analysis and its grain size as deduced from furnace practice, a matter of great importance to a manufacturer in meeting modern specifications for engineering steels in every-day production. (S.)

GRAIN SIZE. *"What About Grain Size,"* C. L. Shapiro, *The Iron Age,* vol. 143, no. 11, March 16, 1939, pp. 25-27. This article is the first part of a three-part paper on this subject. The other two articles will appear in following issues. As most executives, metallurgists, plant superintendents and heat treaters do not have the time to devote many hours per day to reading foreign and domestic publications dealing with controlled grain size or the austenitic grain size of steel, the writer presents within the scope of this paper a concise version of grain size control. Part one, therefore, deals only with various methods by which the austenitic grain size is determined. (S.)

SCRAP. *"Handling Scrap," Steel,* vol. 104, no. 11, March 13, 1939, pp. 57, 78. Conveyor eases worker's burden in steel foundry scrap yard. Men work full 8 hour day with only half former effort. In addition, conveyor almost doubles tonnage output. Some types of scrap handled through shears at 20 tons per hour.

SPECIFICATIONS. *"Specs,"* J. H. Hall, *The Foundry,* vol. 67, no. 3, March 1939, pp. 28, 29, 80, 82. The author describes the importance of specifications and discusses some common troubles both buyers and producers ran into before a standard specification making body was established. Also that care should be taken in making specification so that no particular group of individuals will be injured. As processes and information are changing rapidly, rigid specifications may become harmful instead of helpful. (S.)

Testing

MECHANICAL. *"Practice in Mechanical Testing,"* V. E. Green, *Foundry Trade Journal,* vol. 60, no. 1172, Feb. 2, 1939, p. 111. This article is from a paper read before the Midland Metallurgical Societies. The author describes the beam tensile-testing machine. Calibration and use of the horizontal machines and how the extensometers are used is described. (T.)

RADIOGRAPHY. *"Radiography of Castings," Canadian Metals and Metallurgical Industries,* vol. 2, no. 2, Feb. 1939, pp. 37, 38. Under the stimulation of the increasing demand for aeroplane castings, industrial radiography is making rapid progress in Canada. The type of machine, range and requirements are described. It is stated that when this process was first used the percentage of scrap castings was quite high but recently with 2,000 to 3,000 castings being examined monthly this has been reduced to 7 per cent. Two good illustrations of internal cracks are given. (T.)

Wear

DIESEL ENGINE. *"Wear in Powdered-Fuel Diesel Engines," Foundry Trade Journal,* vol. 60, no. 1172, Feb. 2, 1939, p. 112. The report of the director of fuel research issued with that of the fuel research board contains a section giving the results of an experiment in connection with the powered-fuel Diesel engine. The experimental work was begun to determine whether the high rates of wear encountered in coal-dust Diesel engines could be reduced to practical proportions by suitable choice of materials for the liner, piston and rings. (We.)

Book Notices

Steel and Its Heat Treatment, **by D. K. Bullens, fourth edition, cloth bound brown, Vol. I, 18 chapters, 445 pp., 208 illustrations, price $4.50. Vol. II, 24 chapters, 491 pp., 184 illustrations, price $5.00.**

The complete edition is divided into two volumes. Volume I dealing with principles, processes and control of heat treatment of both carbon and alloyed steel. The three sections of this volume are: (1) Metallurgical Principles, such as testing, annealing, etc., (2) Surface Reaction Processes, such as case carburizing, controlled atmosphere, etc., (3) Heat Treating Operations, such as forged, rolled, furnace, etc.

Volume II deals with engineering and special purpose steels, both carbon and alloy. This volume is also divided into three sections. Section (1) on simple engineering steels describes the more common steels, such as carbon, silicon, copper, etc. Section (2) on more complex composition deals with the lesser fused steels, such as high yield strength, spring, steels based on carbide formers, etc. Section (3) describes the special purpose steels, such as austenite, low and high temperature, etc.

A very handy set of books for the metallurgist and practical foundryman as it is clearly written and contains the latest information. The former edition having been used as a text book in many schools throughout the country, there is no doubt that this edition with its added information will again be used.

"Aluminum Bronze." **C. D. A. Publication No. 31, cloth bound, 7 chapters, 151 pages, 17 diagrams, 66 illustrations, 18 tables, published by Copper Development Association, Thames House, Millbank, London, S. W. 1.**

This publication is concerned with the copper-aluminum series of alloys containing copper as the major constituent. It describes the general properties, cold and hot working, casting, corrosion resistance, production and fabrication, and industrial applications of aluminum bronzes. The photographs are all very clear and of a close-up view thus bringing out the various details of the part illustrated. A bibliography on aluminum bronze subsequent to 1927 is also included. This book is handy reference material and should be especially interesting to American Foundrymen as the foremost literature of the world was used in its preparation.

FUNDAMENTAL FOUNDRY INFORMATION

A Partial List of Available A. F. A. Publications

BOUND VOLUME OF TRANSACTIONS

Containing a wealth of material in papers and committee reports as presented before annual conventions. At present only 5 of these are available. The supplies are limited, but those which are available are for those most recent conventions when papers and reports have been most numerous and on problems and practices of current importance. These volumes are the foundation of any library of foundry reference books.

Publication No.	Vol.	No. Pages	Price to Members	Price to Non-Members
1	46 (1938)	950	$3.00	$15.00
2	45 (1937)	850	3.00	10.00
3	44 (1936)	624	2.00	6.00
4	43 (1935)	722	2.00	6.00
5	41 (1933)	608	2.00	6.00

Publication No. 18

Tentative Recommended Good Practice Code and Handbook on Fundamentals of Design, Construction, Operation and Maintenance of Exhaust Systems (1938).

Price $4.00. To members $2.00.

Third of a series of codes for the control and abatement of occupational disease. Gives complete engineering information. The exhaust systems are detailed on an engineering basis. Will be useful in the purchase of new equipment or exhaust systems, and in the revision, to make more efficient, present systems. Shows how to do the job intended at a minimum cost. Research work performed in developing this code gives entirely new information and data on resistance losses of friction in straight pipes and elbows. Complete with almost 200 pages, including 35 charts and engineering diagrams. Appendix gives an example of an exhaust system completely worked out, step by step, showing the proper use of all rules and formulae given in text.

Publication No. 23

Present Status of Foundry Sand Investigation and Control, by W. G. Reichert, (1935).

Price $1.00. Member's price $0.50.

This is a complete review of foundry sand control by a metallurgist who has established sand control in his plant on practical, economical basis. A publication which everyone connected in any way with the use of sands should have in his handy reference file. It shows how testing and grading methods should be applied, the essentials of sand control for molding and core rooms, the laboratory and the superintendent's office. Written in understandable style for the practical shop man, yet is of the greatest value to the foundry engineer.

Publication No. 12

Job Evaluation and Time Motion Study and Job Standardization

Heavy paper binding, 49 pp., 6x9, (1937). Price $1.00. To members $0.50.

Proceedings of 1937 convention session on job evaluation and foundry time study, together with discussion. The paper on time study and job standardization outlines methods used in a foundry carrying on jobbing type of work, giving charts of various molding operations. The job evaluation paper describes system used in a large plant to establish a wage rate for each job in the factory.

Publication No. 28

Molding Sand in the Malleable Iron Foundry, by H. W. Dietert and F. Valtier.

16 pp. 6x9 (1936). Price $0.40. To members $0.20.

A survey of sands used in malleable foundries. Twenty-six sands from various foundries checked, covering both natural and synthetic types. Foundry data given on properties. A summary presents comparison of practices followed in the shops.

Publication No. 34

Symposium on Malleable Iron Castings

122 pp. 6x9 (1931), Heavy Paper Binding. Price $0.75.

The importance of malleable iron as a material of engineering emphasizes the need of accurate, reliable information upon its manufacture, its properties and other facts of value to the user of the material. This Symposium is published jointly by A.F.A. and A.S.T.M.

Publication No. 35

Pearlitic Malleable Cast Iron

An A.S.T.M. publication. 32 pp., 6x9, (1936). Price $0.60; to A.F.A. and A.S.T.M. members $0.35.

Compiled from various sources by a special committee of the A.S.T.M. Covers classification, producer's data on various classes and patent literature. Considered of much value to those interested because published data since 1923 is largely in patent papers.

Publication No. 40

Recommended Practices for Sand Cast Manganese Bronze. Committee Report.

9 pp. 6x9 (1938). Price $0.60. To members $0.30.

This report is limited to sand cast manganese bronze alloys and is divided as follows: (1) Molding, (2) Melting and pouring, (3) Finishing, (4) Heat treatment, (5) Defects, their causes and prevention, (6) Chemical control limits, (7) Typical properties of sand castings, (8) Conforming specifications, and (9) Development and field of use.